

S

INFINITY Medside Data Station

Windows NT4 Version
Service Manual



ADVISORY

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1 Introduction

In keeping with the Service Strategy for the Medside Data Station (MDS), this Service Manual provides the necessary information required to troubleshoot and service a Windows NT-based MDS. The MDS is powered by an AC/DC power adapter, and can be placed on a desktop or attached to a wall bracket. Control of all Medside Data Station functions is done by means of a keyboard and a mouse. (It is recommended that the keyboard and mouse be purchased through SIEMENS, to avoid any possible incompatibility problems). The display screen has a 1280 x 1024 resolution capabilities which enables the user to display and run applications such as INFINITY™ Explorer and Webview.

For the purpose of clarification, special text in this Service Manual is described below:

- Bold Characters** text that is to be typed in by the User.
 ^ Character a space required between typed characters.
Italic Characters a selection that is required by the User.

2 Troubleshooting

If the Medside Data Station should fail to respond properly, use the procedures below to aid in identifying and remedying the problem.

2.1 Power Problem

2.1.1 No Response when power On/Off switch toggled ON

Refer to Table 2-1 to troubleshoot Power-On problems.

Table 2-1 Power-On Problem

Conditions	Possible Cause(s)	Troubleshooting and Remedial Action
MDS connected directly to Power Adapter; Power Adapter LED not illuminated	Power source. Power Adapter malfunction. MDS Malfunction.	1. Assure Power Adapter is connected to an active hospital power source. 2. If problem persists, disconnect power adapter from MDS and measure voltage between Power Adapter output pins. • If voltage < 11.6 VDC or > 13.8 VDC, replace Power Adapter. • If voltage = 11.6 to 13.8 VDC, contact TSS in Solna or Danvers.
MDS directly connected to Power Adapter; Power Adapter LED On, MDS charger LED not illuminated.	Power Adapter malfunction. MDS Power Switch MDS malfunction.	1. Disconnect power adapter from MDS and measure voltage between Power Adapter output pins. • If voltage < 11.6 VDC or > 13.8 VDC, replace power adapter. • If voltage = 11.6 to 13.8 VDC, contact TSS in Solna or Danvers.
MDS directly connected to Power Adapter; MDS Charger LED illuminated. No Power On LED.	MDS Power Switch malfunction. MDS malfunction.	1. Switch MDS Power to On. 2. If MDS fails to Power-up, contact TSS in Solna or Danvers.

Table 2-1 Power-On Problem (Continued)

Conditions	Possible Cause(s)	Troubleshooting and Remedial Action
MDS not connected to A/C Power Adapter; Power switch On, Power LED not illuminated.	Internal UPS Battery discharged. Replace Internal battery. MDS malfunction	1. Connect MDS to A/C Power Adapter. 2. Switch MDS Power switch to On and verify that battery charger LED illuminates. Note: If Power On LED fails to illuminate, contact TSS in Solna or Danvers. 3. If battery charger LED fails to illuminate, leave power adapter connected to MDS for $\approx$ 1hr. 4. After 1 hr. disconnect MDS from Power Adapter and switch MDS Power On/Off switch Off, and then On. • If Power LED is green, reconnect MDS to Power Adapter and leave MDS connected an additional 8 hours to charge internal battery. • If Power LED is not green, replace Internal batteries. 5. If problem still persists, contact TSS in Solna or Danvers.

2.1.2 Power On/Off Piezo Tone Fails to Sound.

Table 2-2 Power-off Alarm Malfunction

Symptom(s)	Possible Cause(s)	Troubleshooting and Remedial Action
Piezo tone fails to sound when MDS powered On, if MDS loses power, or when MDS is powered-Off.	Speaker. MDS malfunction.	Contact TSS in Solna or Danvers.

2.1.3 Power-Up Sequence Fails to Complete Properly

Table 2-3 Power-up Process Malfunction

Symptom(s)	Possible Cause(s)	Troubleshooting and Remedial Action
Power inputs OK, but MDS fails to complete boot up.	Bios failure. Software program corrupted. Hard Drive failure. MDS malfunction.	1. If MDS displays error message proceed to "Appendix B: Bios Messages" on page 43, and "Appendix C: POST Error Codes" on page 47 to identify failure. 2. Check BIOS configuration according to Section 2.2. 3. If BIOS configuration OK, reinstall Windows™ NT4 according to Section 3 starting on page 7. 4. If problem still persists, contact TSS in Solna or Danvers.

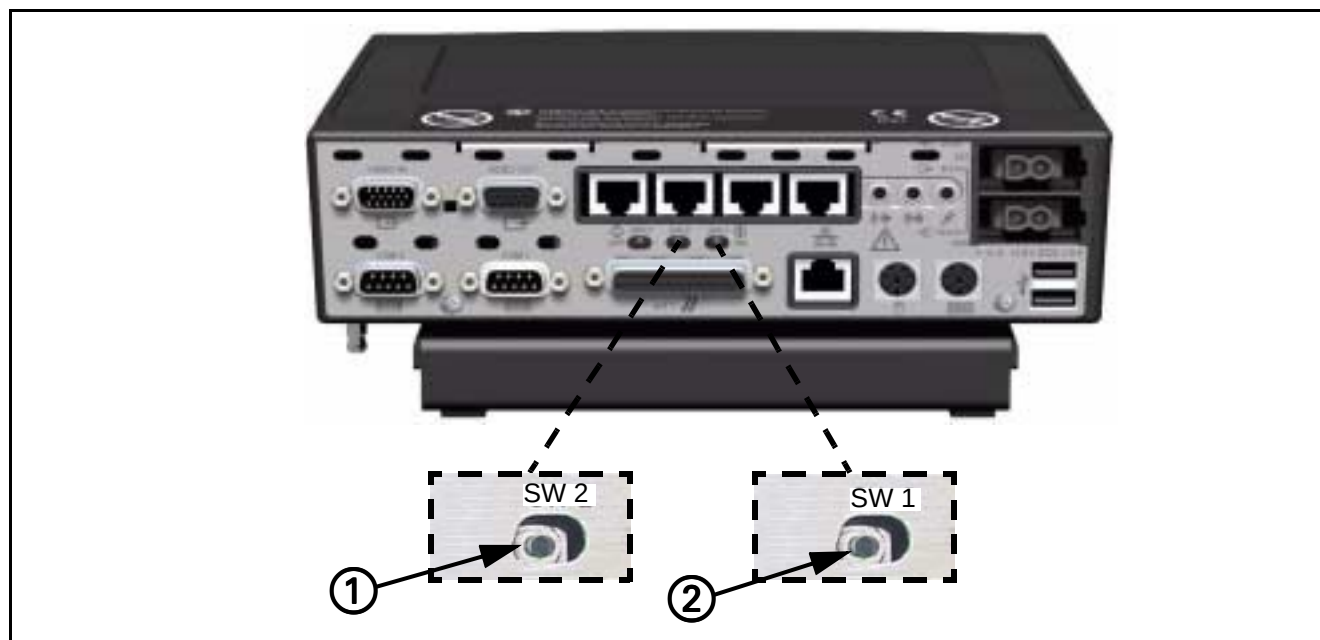


Figure 2-1 MDS switch settings

2.1.4 No Video display

Table 2-4 Video malfunction

Symptom(s)	Possible Cause(s)	Troubleshooting and Remedial Action
MDS power LED On. No video on LCD/CRT Display.	Cable problem. No power to Display. Bad display. Video switch set incorrectly. MDS malfunction.	1. Check both ends of video cable and ensure cable is connected. 2. If problem persists, verify power source to display. 3. If problem persists, switch out display with a known good display. 4. If problem persists, verify MDS video switch position (see ① in Figure 2-1) at rear of MDS is set to right. 5. If problem still persists, contact TSS Danvers/Solna.

2.1.5 MDS Fails to boot properly

Table 2-5 Power On/MDS Malfunction

Symptom(s)	Possible Cause(s)	Troubleshooting and Remedial Action
MDS power LED On. MDS Resets after successful boot.	Watchdog timer switch set incorrectly. BIOS problem. MDS malfunction	1. Verify Watchdog timer switch position (see ② in Figure 2-1) at rear of MDS is set to left. 2. If problem persists, check BIOS configuration as described in Section 2.2. 3. If problem still persists, contact TSS Danvers/Solna.

2.2 BIOS Setup

The MDS is configured at the factory for default settings that provide proper operation. Use the following procedure to check MDS BIOS setup, if MDS does not boot to WindowsNT boot loader screen. Changing BIOS settings is not necessary on a new MDS, unless system failure occurs.

1. Switch MDS Power On/Off switch to On.

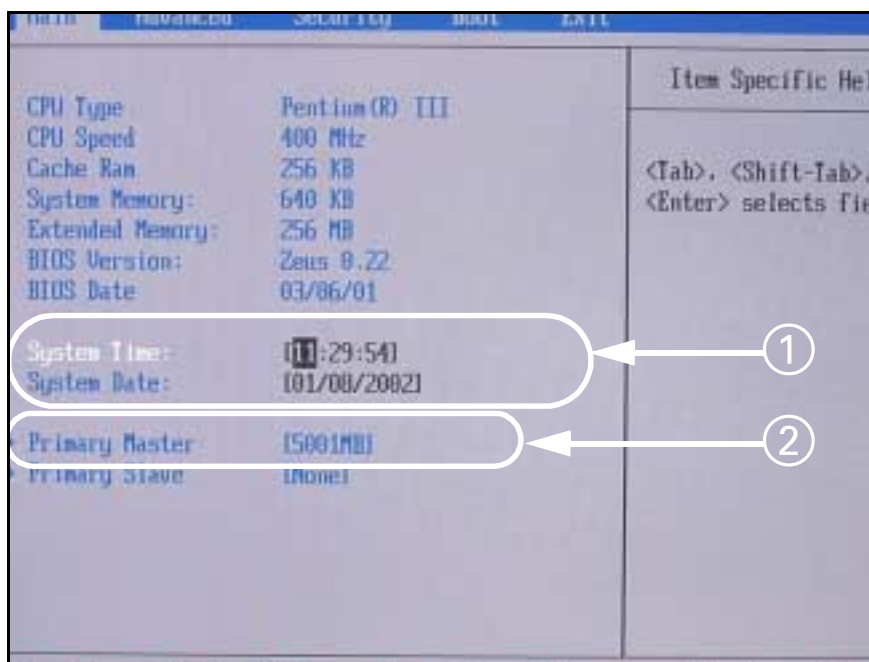


Figure 2-2 Main screen

2. Press and hold **F2** key to gain access to PhoenixBIOS Setup Utility.
3. Press **F9** key, then press **<Enter>** to load default BIOS configuration settings.
4. Press **F10** key, then press **<Enter>** to save configuration settings.
Note: After **<Enter>** key is pressed, MDS will reboot.
5. Verify that MDS boots to Windows NT OS loader screen. If MDS does not boot to OS loader screen, proceed to step 6.
6. Toggle MDS On/Off power switch Off, and then On to reboot MDS.
7. Press and hold **F2** key to gain access to PhoenixBIOS Setup Utility.
8. Enter correct date/time (① in Figure 2-2) for clinical site, using arrow/number keys.
9. Verify correct "Primary Master" settings as shown in (② in Figure 2-2).

Note: If Primary Master is incorrect, use up/down arrow keys to select Primary Master, and then press **<Enter>** key.

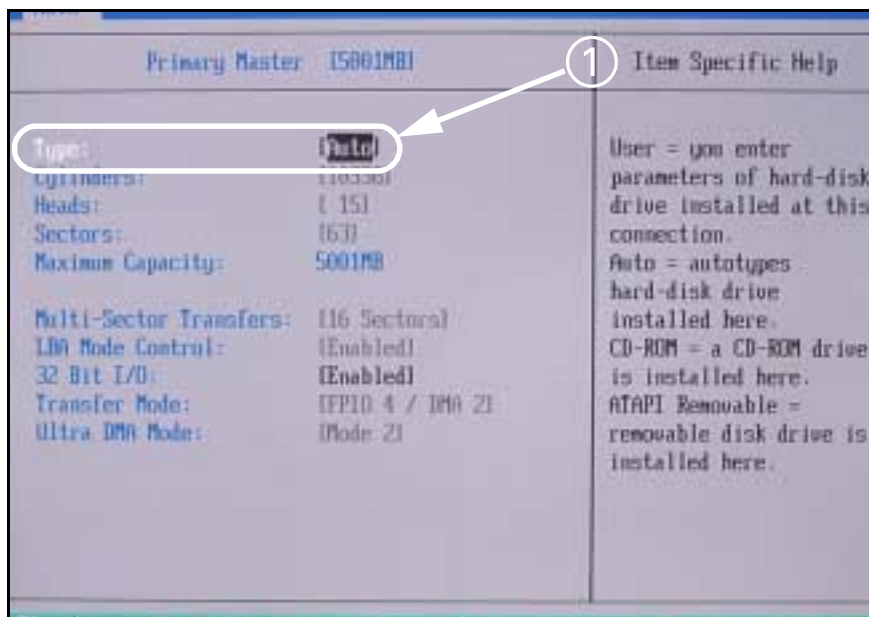


Figure 2-3 Hard drive settings

10. Use +/- keys to select type to Auto (① in Figure 2-3).

11. Press *ESC* key to get back to “Main” tab.

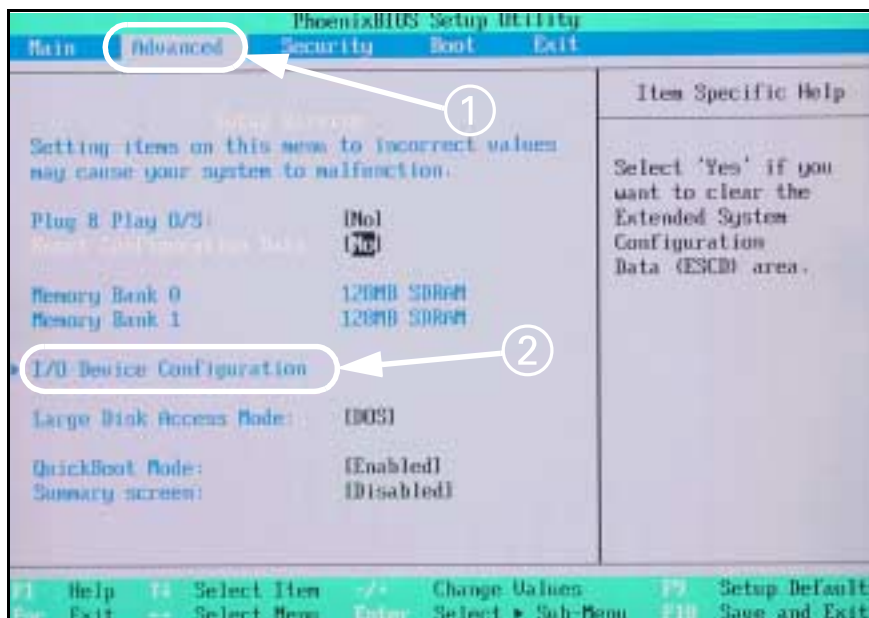


Figure 2-4 Advanced settings

12. Use left/right arrow keys to select “Advanced” tab (① in Figure 2-4).

13. Verify correct “Advanced” settings as shown in Figure 2-4.

Note: If changes need to be made use up/down arrow keys.

14. Use up/down arrow keys to select I/O Configuration (② in Figure 2-4), and then press *<Enter>* key.

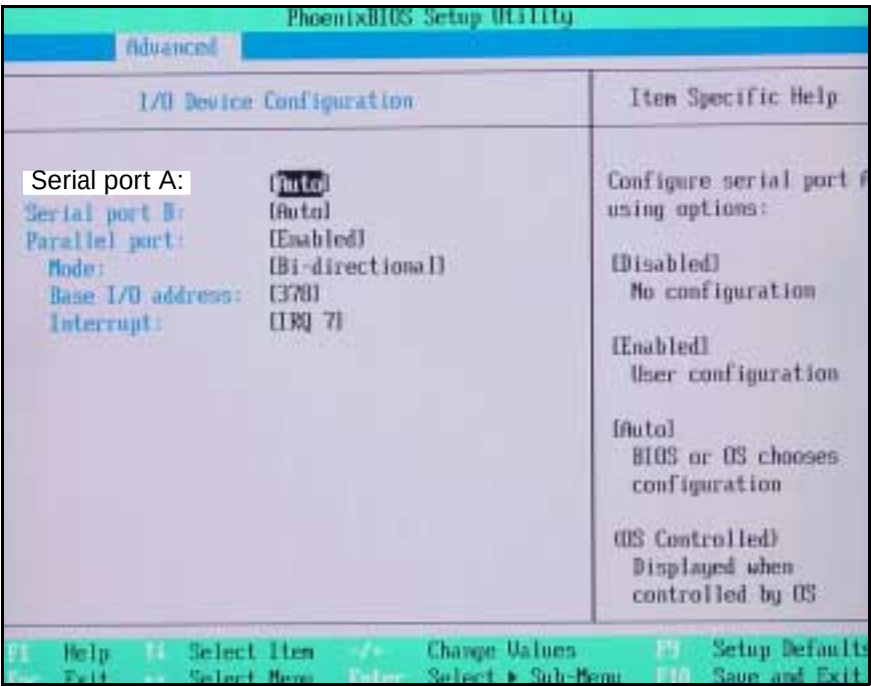


Figure 2-5 I/O Device configuration

15. Verify correct “I/O Device Configuration” settings as shown in [Figure 2-5](#).

Note: Use left/right arrow and +/- keys to make changes.

16. Press *ESC* key to return to main menu.

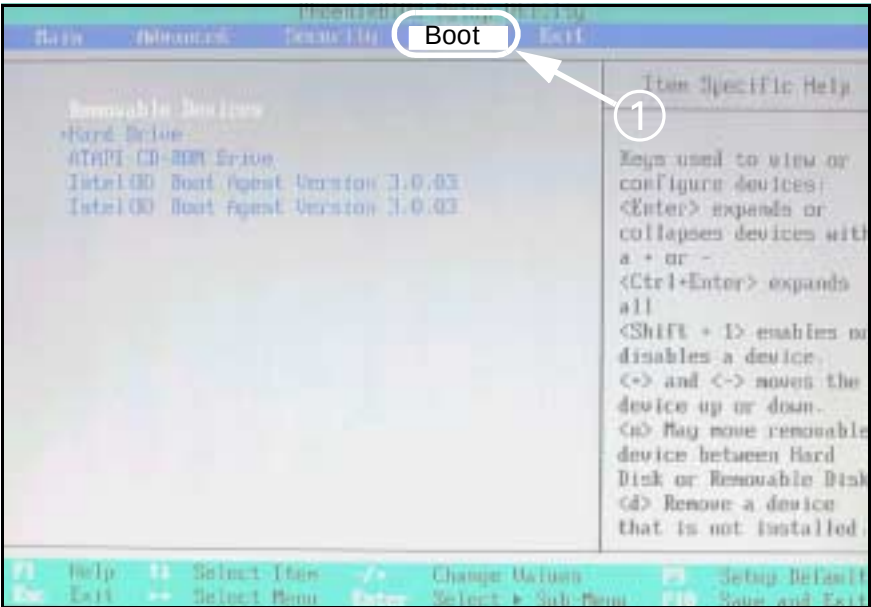


Figure 2-6 Boot settings

17. Use up/down arrow keys to select “Boot” tab (① in [Figure 2-6](#)).

18. Verify correct “Boot” order as shown in [Figure 2-6](#).

Note: Use left/right arrow and +/- keys to make changes.

19. Press *F10* key, and then press *<Enter>* to save configuration settings.

Note: After <Enter> key is pressed, MDS reboots.

20. Verify that Windows NT OS loader screen appears.
21. If MDS fails to boot to OS loader screen, proceed to [Section 4](#) to Phlash BIOS.
22. If Phlash BIOS setup procedure does not boot to Windows NT OS loader screen, proceed to [Section 3](#) and re-install Windows NT4. If problem still exists, contact TSS in Danvers/Solna.

3 Reinstalling NT4 Operating System and Installing Optional Drivers

This section explains how to reinstall Windows NT4 and also references how to install Optional Hardware Drivers onto a Medside Data Station hard drive.

Note: NT4 reinstallation should not be required on a new MDS. The factory installs Windows™ NT4 on the MDS prior to shipment.

In addition to these instructions, the following Hardware and Software is required:

- Siemens Service Laptop meeting minimum Hardware requirements as specified by Med QM document ARTD-001.719.06.04.02 (V01) M4 or greater.
- RJ45 crossover cable.
- MDS Software Recovery CDROM (shipped with MDS).

NT4 Reinstallation

NT4 reinstallation requires making a network boot connection between an MDS RJ-45 network port, and a Windows 95/98 Laptop/PC RJ-45 network port, and then transferring the Windows NT4 image from the Laptop/PC CDROM drive to the MDS Hard Drive.

Optional Hardware

MDS Optional Hardware includes a Teac™ CDROM Drive, Backpack™ CDRW Drive, and Microsoft™ Optical Mouse. Refer to "Loading Software" section in INFINITY™ Medside Data Station Reference Manual for Teac CDROM drive and Backpack CDRW drive operation.

An Optical Mouse driver CDROM is shipped with each Optical Mouse. This driver must be loaded through a network connection to the MDS. Contact local IT department for network connection configuration.

3.1 Laptop Configuration

Setup the Service laptop as follows to allow network connectivity between a Laptop CDROM drive and an MDS Hard drive.

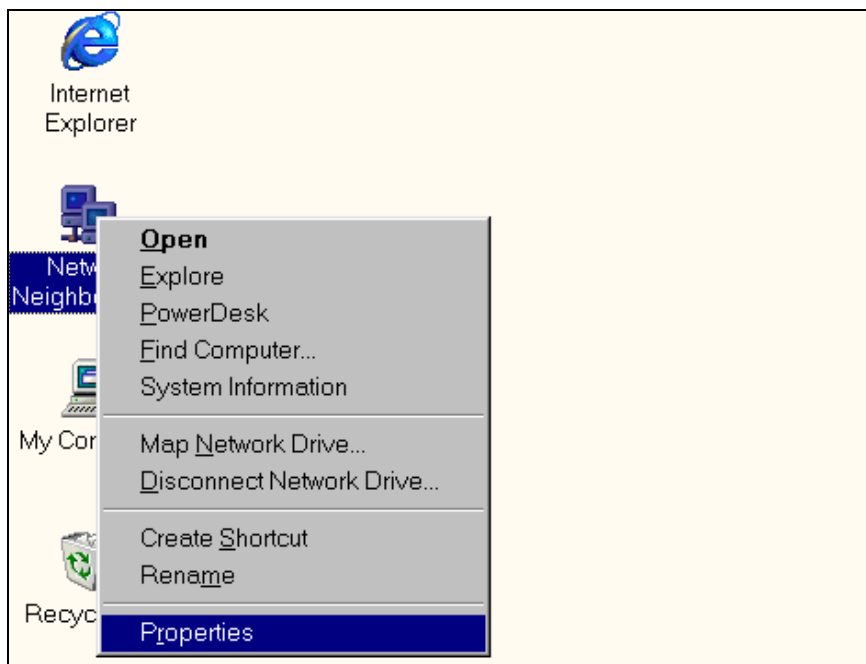


Figure 3-1 Windows Main Menu

3.1.1.1 TCP/IP Setup

1. Boot Service Laptop to Windows™ 95/98 screen.
2. Right-click on *Network Neighborhood* icon (see [Figure 3-1](#)) and click on *Properties*.

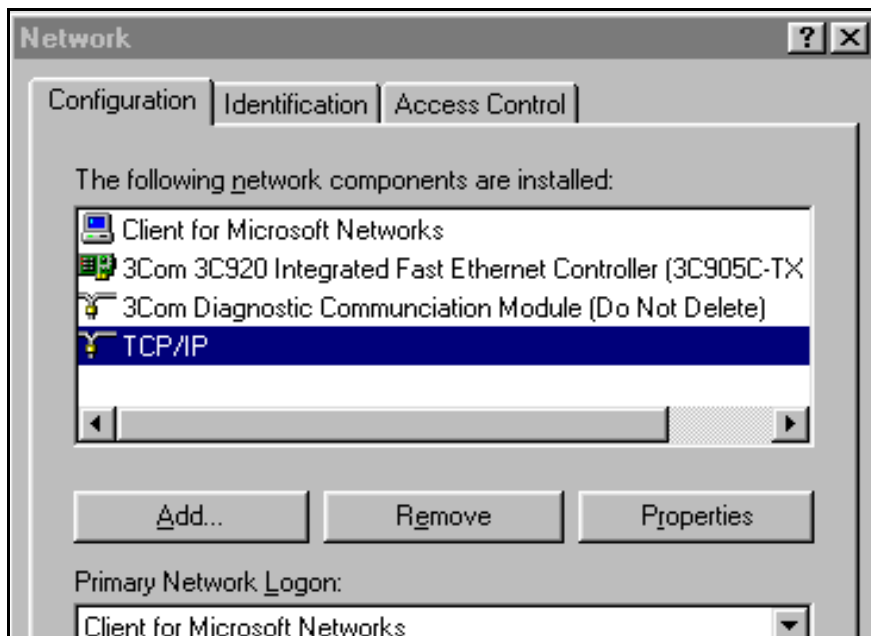


Figure 3-2 Network Window

3. At "Network" window (see [Figure 3-2](#)) click on *Configuration* Tab, scroll down to Laptop TCP/IP Ethernet Adapter, and select *Properties*.

Note: TCP/IP Ethernet Adapter name is unique according to specific adapter used on laptop. Refer to Service Laptop Ethernet Adapter vendor document for specific name.

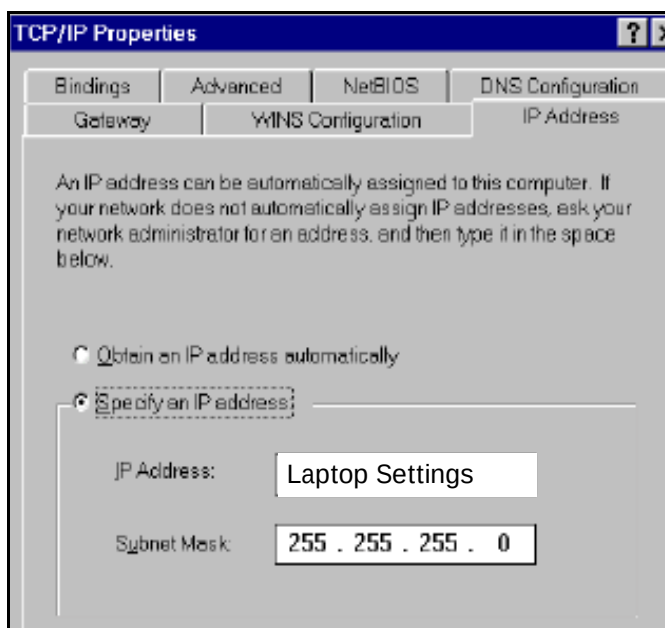


Figure 3-3 TCP/IP Window

4. Copy "IP Address" to the following line: _____

Note: IP Address is needed to reconfigure the service laptop back to its original configuration, after completing NT4 reinstallation.

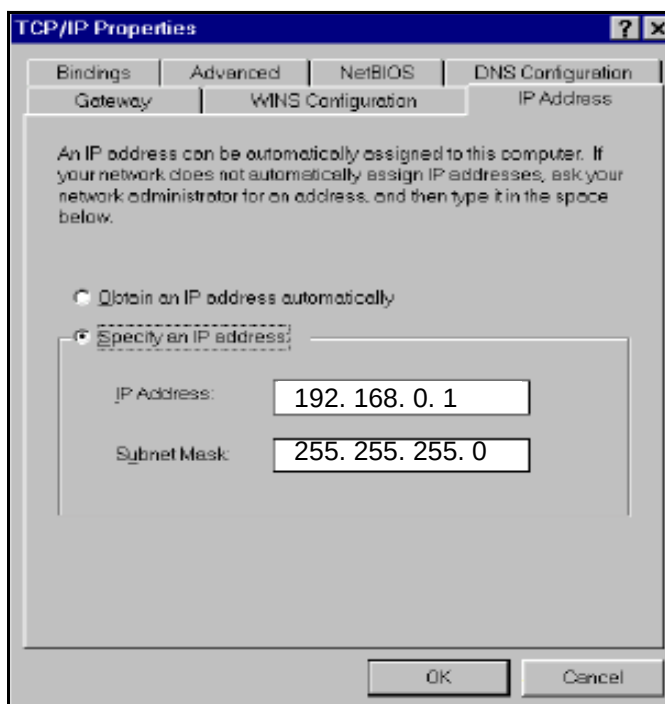


Figure 3-4 TCP/IP Window

5. Type new IP address 192.168.0.1 as shown in [Figure 3-4](#), then click on OK button.

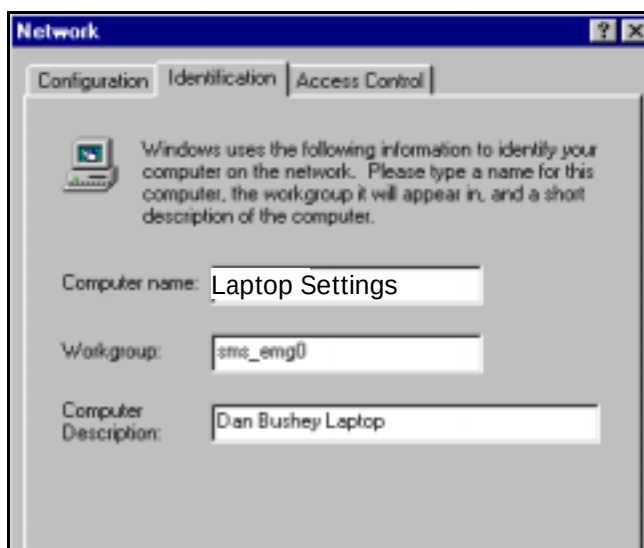


Figure 3-5 Network window

6. At "Network" window (see [Figure 3-5](#)) click on *Identification* Tab.

7. Copy Computer Name to the following line: _____

3.1.2 CDROM Share Configuration

The service laptop CDROM must be set up for file sharing. Complete the following section to configure service laptop CDROM for file sharing.

1. Select *Start* and scroll to *Programs*, and then *Windows Explorer*.

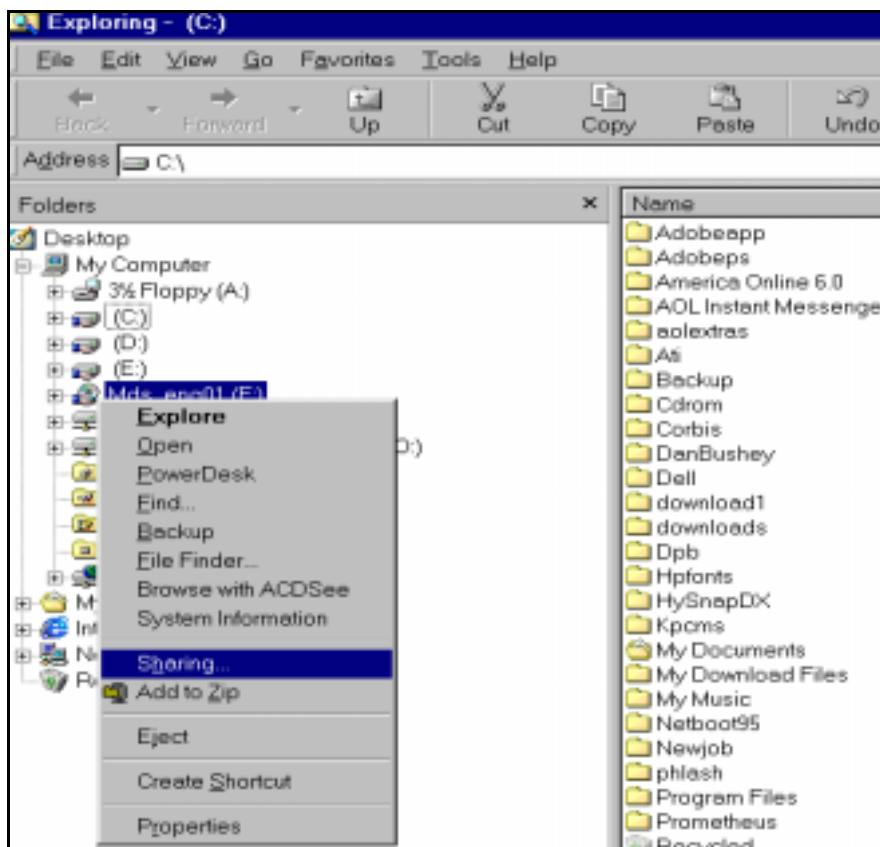


Figure 3-6 Windows Explorer

- At "Exploring" window, right-click on *CDROM* icon and select *Sharing* from drop down menu (see Figure 3-6).

Note: Steps 2-4 can also be used to set up file sharing of laptop hard drive (eg. "C" drive, "D" drive) and laptop floppy drive ("A" drive) by selecting that drive in step 2 and providing a unique user-provided share name in step 3.

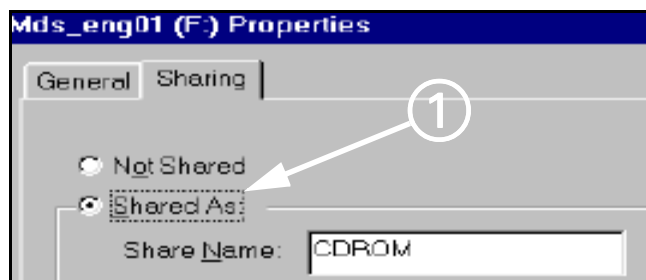


Figure 3-7 Properties Window

- At "Properties" window, click on *Shared As* button (① in Figure 3-7), type **CDROM** in "Share Name:" box, click on *Apply*, then click *OK*.

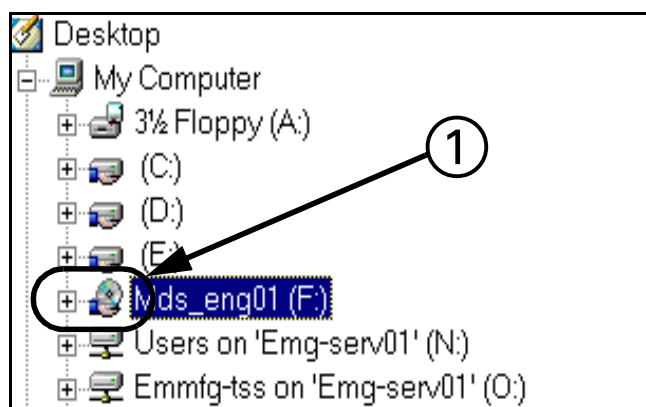


Figure 3-8 Windows Explorer

- Verify that there is a hand shown below the CDROM icon (see ① in Figure 3-8).

3.1.3 Install MDS Utility

The MDS requires the use of a software utility to make a low level connection between a MDS and a Service Laptop. This utility is also used to transfer data between the two devices. Install the MDS software Utility as follows:

- Insert MDS Recovery CDROM (shipped with MDS) into Service laptop CDROM Drive.
- At Service laptop Windows screen, select *Start* and scroll to *Programs*, then *Windows Explorer*.

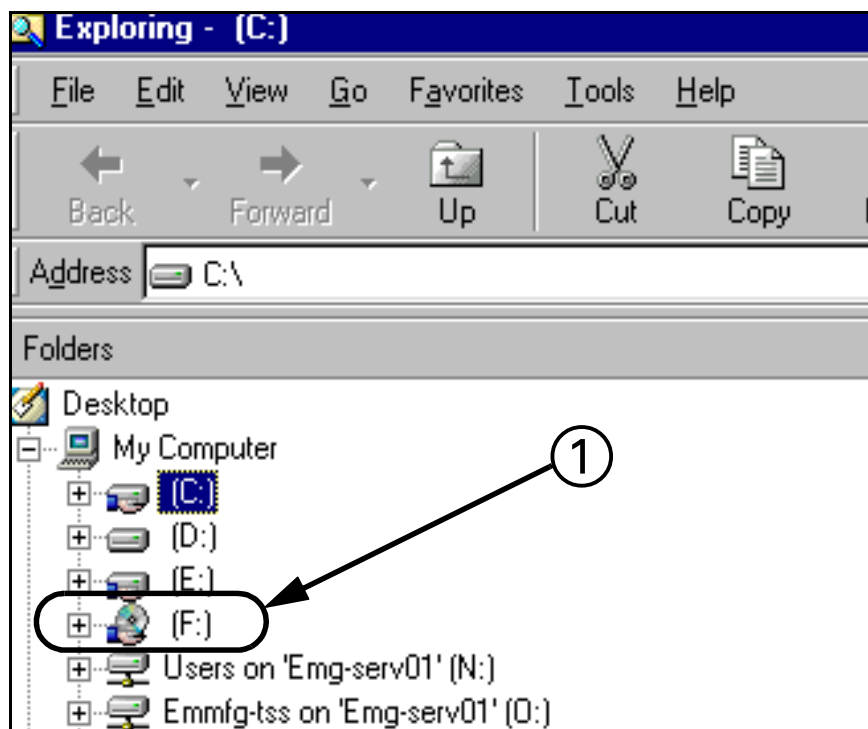


Figure 3-9 Explorer Window

3. Click on *CDROM* icon (① in Figure 3-9) in left pane of “Explorer” window.
4. Double click on *Tftpboot* directory in right pane of Explorer window.
5. Double-click on *Remoteboot.exe* file in right pane of Explorer window.

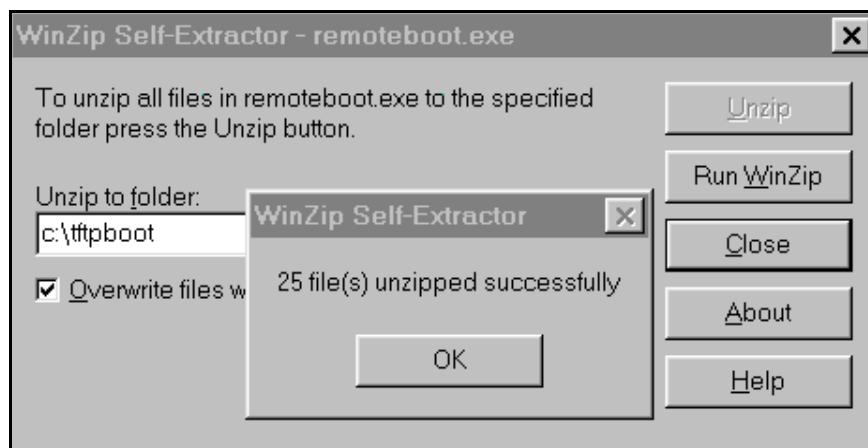


Figure 3-10 Win Zip Extractor Window

6. Click on *Unzip* button.

Note: Files are extracted to tftpboot folder on the laptop “C” drive. Once files have been extracted, the Win Zip Self-Extractor windows appear, indicating 25 file(s) unzipped successfully (see Figure 3-10).

7. Click on *OK*, then *Close* in “Win Zip Self-Extractor” windows.
8. Close “Windows Explorer” window.

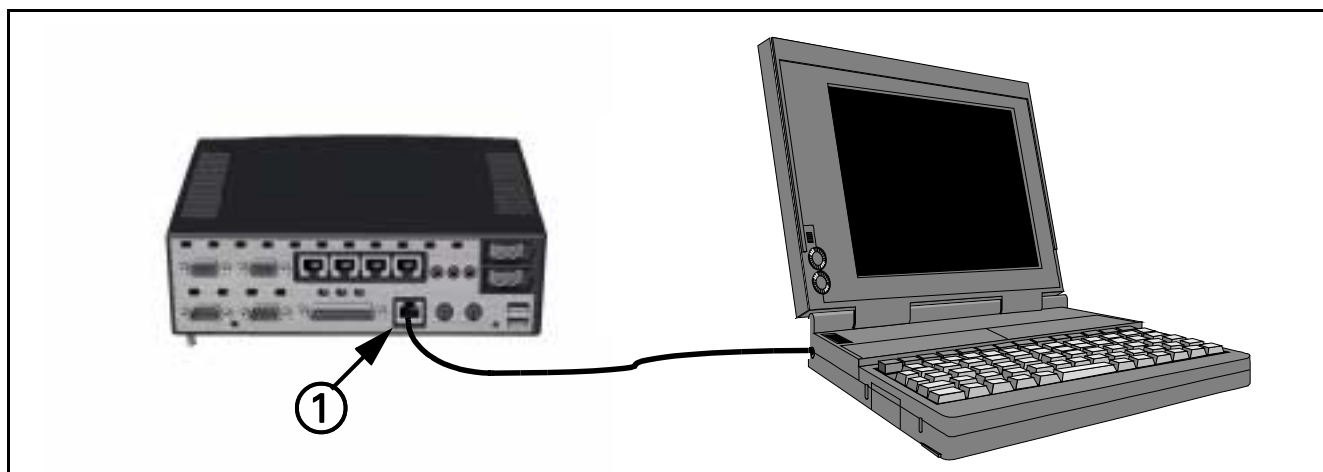


Figure 3-11 MDS, Laptop Hardware Connection

3.2 MDS to Service Laptop Interface

1. Connect Crossover Cable from Laptop Network Interface Card Ethernet Port to MDS Main Ethernet Port (① in [Figure 3-11](#)).
- Note: Ensure MDS is not connected to Hospital Network.**
2. Connect MDS Power Adapter, Keyboard, Mouse, and Monitor according to MDS Hardware Installation Instructions. Refer to Doc. No. T951-01-7600 (shipped with MDS).

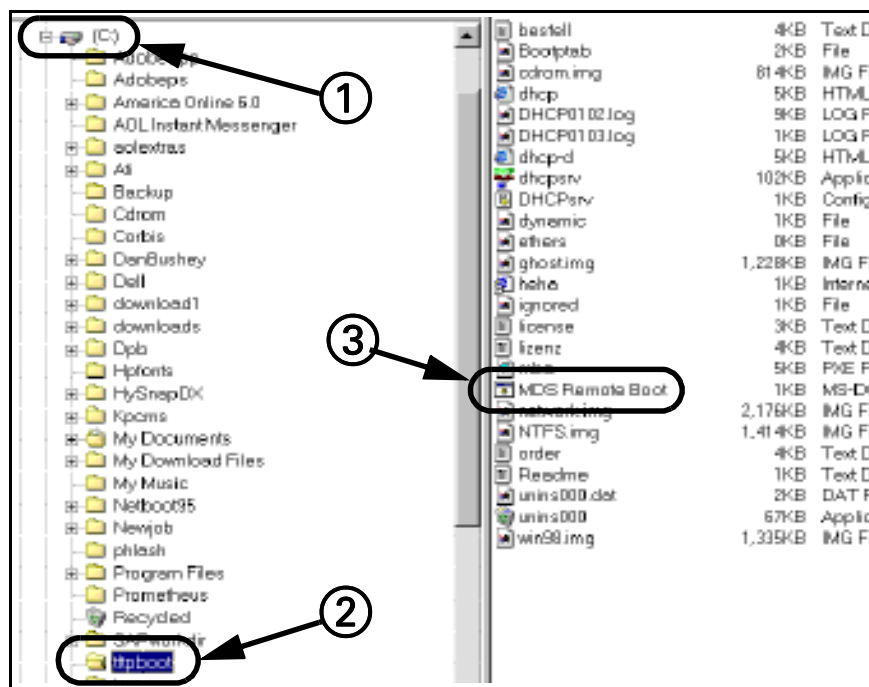


Figure 3-12 Windows Explorer

3.3 Launch MDS Utility

1. At Laptop Windows screen, select *Start* and scroll to *Programs*, and then to *Windows Explorer*.
2. Double-click on C drive icon (① in [Figure 3-12](#)) in left pane of window.
3. Click on *tftpboot* folder (② in [Figure 3-12](#)) in left pane.

Note: Verify power On/Off switch on MDS is Off.

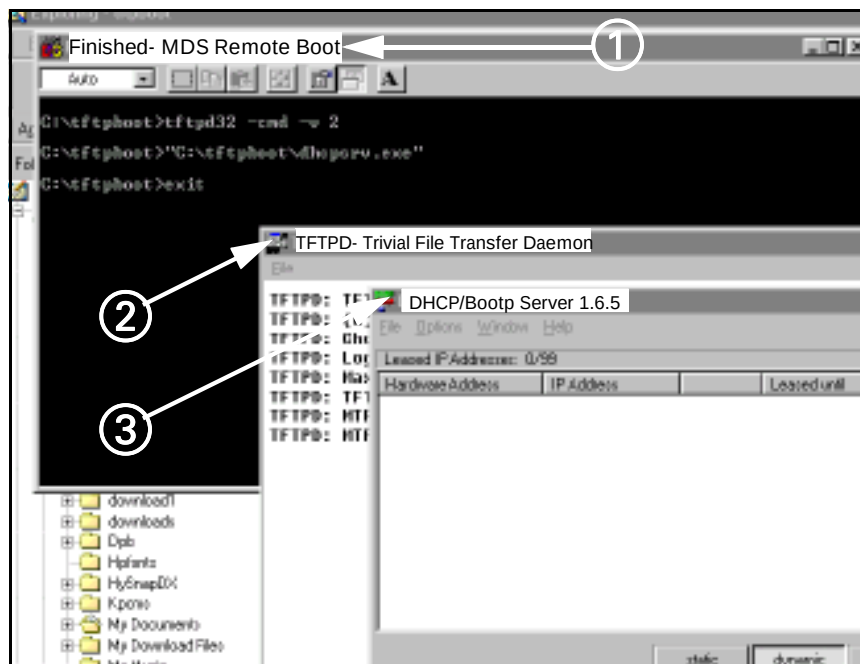


Figure 3-13 Window TFTP

4. Double-click on *MDS Remote Boot* icon (③ in Figure 3-12) in right pane.
5. Verify “Finished - MDS Remote Boot” window (① in Figure 3-13) opens, then “TFTP - Trivial File Transfer Daemon” window (② in Figure 3-13) opens, then DHCP/Bootp Server 1.6.5 window (③ in Figure 3-13) opens. If windows not displayed repeat steps 2-4 above.

Note: DHCP/Boottp Server 1.6.5 window may open minimized. If window is not displayed on Main screen, (③ in Figure 3-13) check to see if program is in Windows Task bar at bottom of screen.

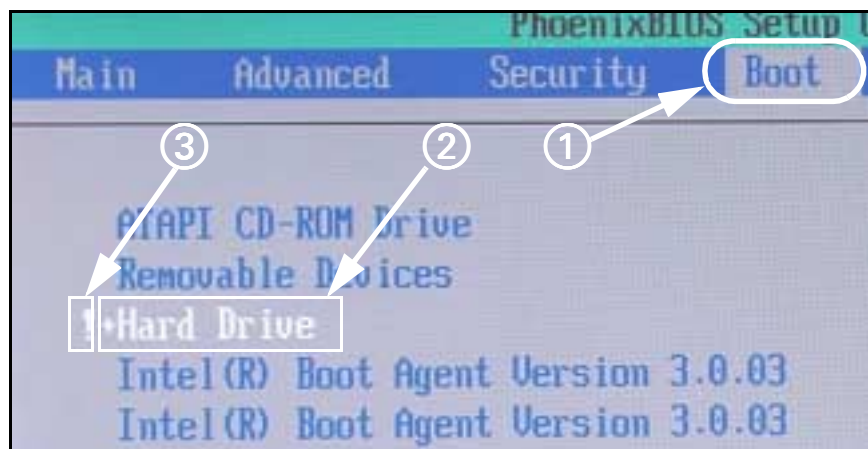


Figure 3-14 Setup Utility Window

3.4 MDS Network Boot

1. Switch Power On/Off switch on MDS to On.
2. Press and hold F2 key to enter BIOS setup.
3. At PhoenixBIOS Setup Utility window, use MDS keyboard left/right arrow keys to Select *Boot* Tab (① in Figure 3-14).
4. Use MDS keyboard Up/Down arrows to Select *+Hard Drive* (② in Figure 3-14).

5. Hold down on *Shift* key, and momentarily press **!** key.
6. Verify that an exclamation point **!** appears to the left of *+Hard Drive* (③ in [Figure 3-14](#)).
7. Press MDS keyboard *F10* key.
8. Press **<Enter>** to save and exit.

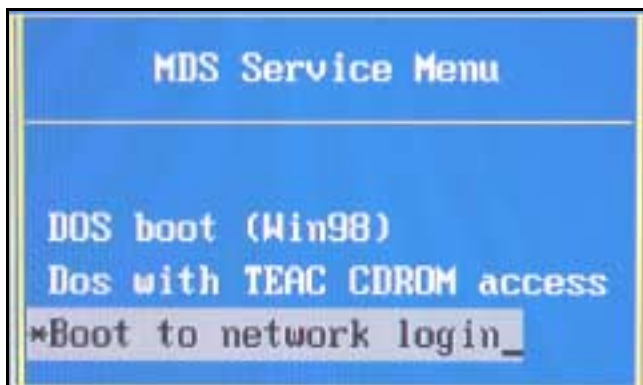


Figure 3-15 MDS Service Menu

9. Verify MDS reboots to “MDS Service Menu” (see [Figure 3-15](#)).
10. Use MDS keyboard Up/Down arrows, if necessary, to Select *Boot to network login*, and then press **<Enter>**.

3.5 Mapping MDS

After pressing **<Enter>**, the MDS Utility establishes a network link between the Service Laptop and the MDS. Once this link has been established, the **A:\>** prompt appears at bottom of screen.

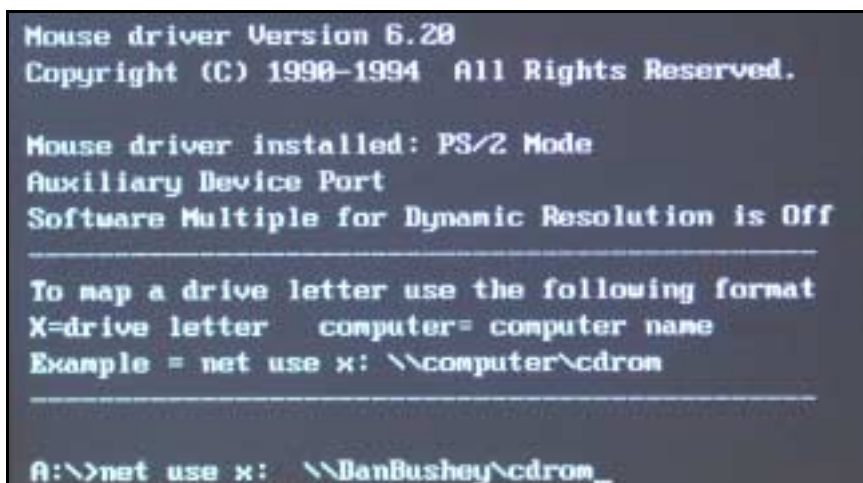


Figure 3-16 Map M.D.S. to CD ROM drive

The text after the **A:\>** prompt displays an example of how to map the MDS to a Service Laptop CDROM Drive (see [Figure 3-16](#)).

11. After the **A:\>** prompt, type **net use x: \\computername\shared drivename**, and then press **<Enter>**.

Note: **Computer name** = name noted in step 7 of [Section 3.1.1](#), and **shared drive** = name of drive typed in step 3 of [Section 3.1.2](#).

12. At message “Type your user name, or press ENTER if it is ADMINISTRATOR:”, press **<Enter>**.

13. At message "Type your password:", press <Enter>.
14. At message "Please confirm your password, so that a password list may be created:", press <Enter>.
15. At A:\> prompt, type **x:** and then press <Enter>.

3.6 Install NT4 Image

Caution:

Windows™ NT4 reinstallation must be performed only in cases where the MDS hard drive has been replaced with a new blank hard drive, or if NT4 is corrupted and reinstallation is a final troubleshooting procedure. All data (non-NT4) files must be backed up before proceeding with reinstallation, as the MDS hard drive is erased (formatted) during the reinstallation process.

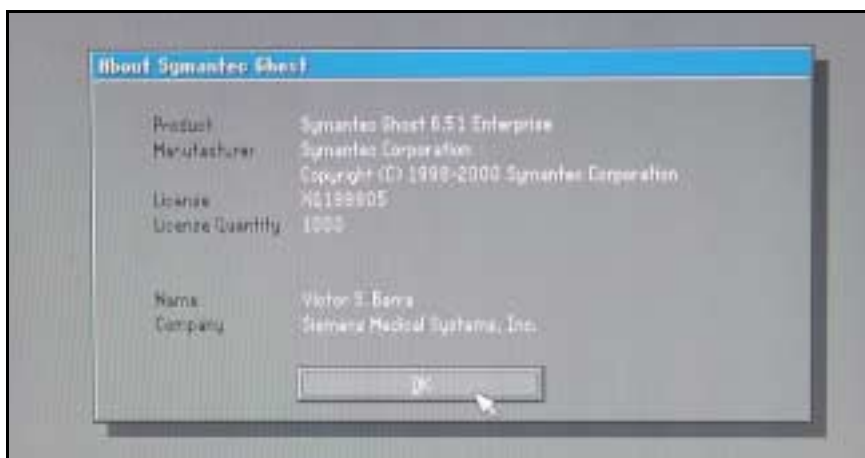


Figure 3-17 Norton Ghost menu

1. At X:\> prompt type **ghost**, and then press <Enter>.
2. After Norton™ Ghost screen appears, click on OK to begin using Norton Ghost Utility.

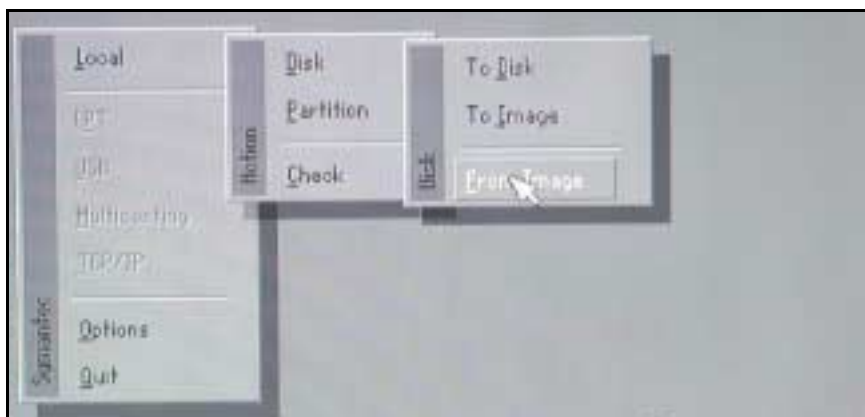


Figure 4-1 Utility Window

3. At Norton Ghost Utility window, select Local → Disk → From Image.
4. Click on *From Image*, and then press <Enter>.

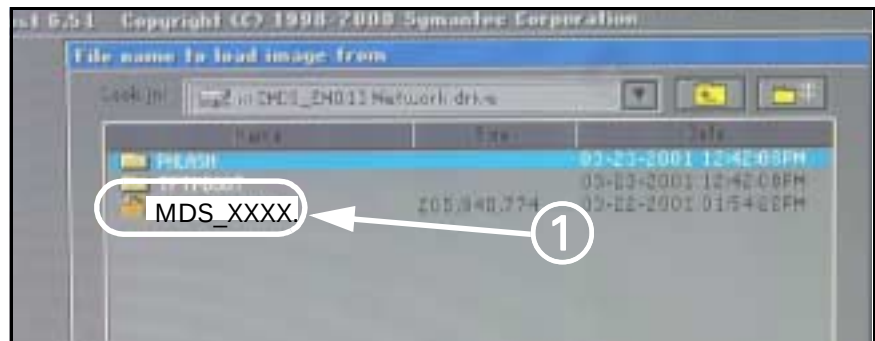


Figure 4-2 Image Folder (Image file)

- At "File name to load image from" window, click on *MDS_XXXX.GHO* (see ① in Figure 4-2).

Note: xxxx=language version.

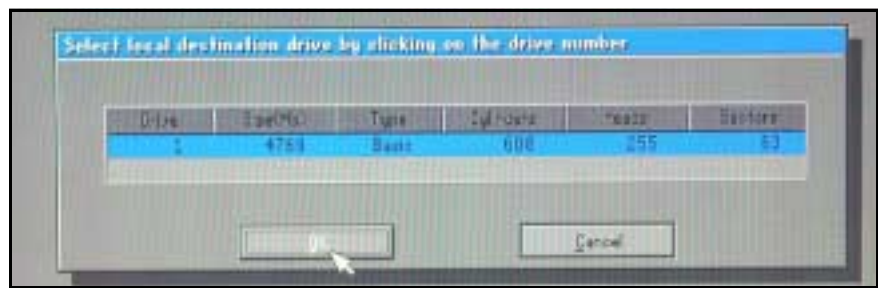


Figure 4-3 Drive Number Window

- At "Select local destination drive by clicking on the drive number" window, click on OK button.

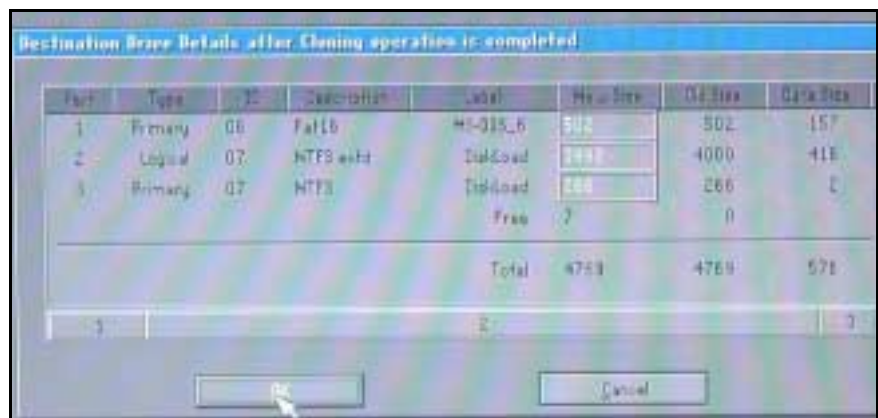


Figure 4-4 Destination Drive Window

- At "Destination Drive Details" window, click on OK button.

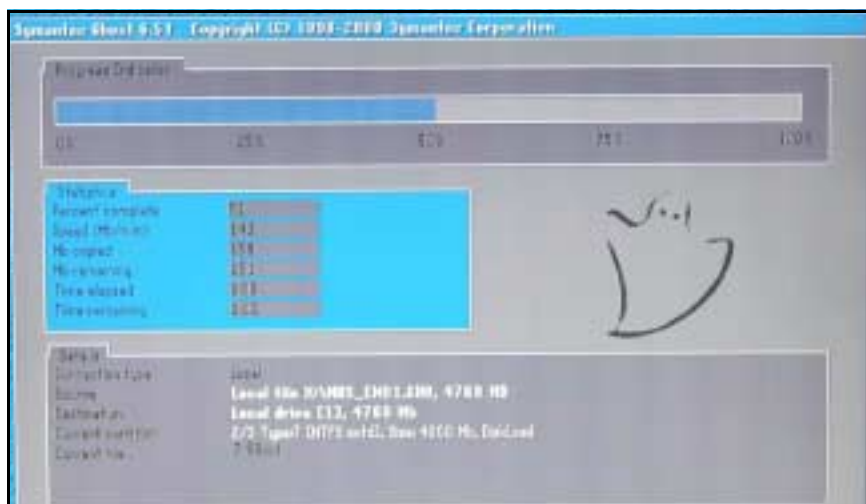


Figure 4-5 Image Transfer Window

8. At "Question" window, click on Yes to proceed with disk load.

Note: Ghost image is transferred from the Service Laptop CDROM drive to the MDS hard drive. Once Ghost image has been transferred "Clone Complete" window appears. See [Figure 4-6 on page 18](#).



Figure 4-6 Clone Window

9. At "Clone Complete" window, click on *Continue* to return to Ghost Main Utility page.



Figure 4-7 Main Window

10. At Main Utility window, click on *Quit*.

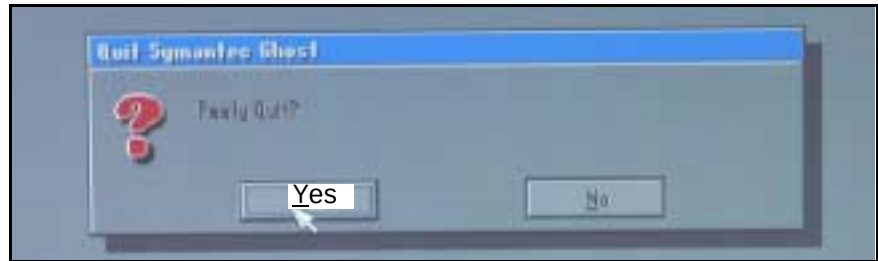


Figure 4-8 Quit Symantec Ghost Window

11. At "Quit Symantec Ghost" window, click on Yes to return to X:\> prompt.
12. At MDS keyboard, press and hold *Ctrl +Alt +Delete* keys to reboot MDS.
13. Press and hold MDS *F2* key to enter PhoenixBIOS Setup Utility.
14. Complete steps 2 and 3 in [Section 3.4](#) (removing exclamation point from left side of "+Hard Drive") to enable MDS hard drive boot.
15. Press MDS keyboard *F10* key, and then press <Enter> to save and exit.

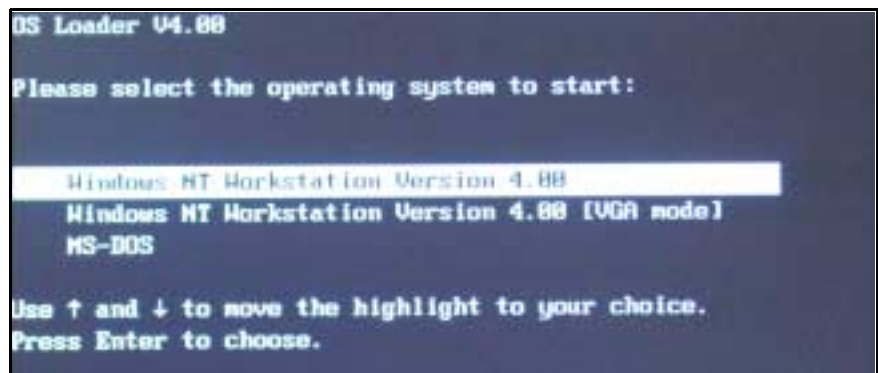


Figure 4-9 Windows Login Screen

16. Verify that MDS boots to Windows NT OS loader screen (see [Figure 4-9](#)), and then automatically continues to Hardware Profile/Configuration Recovery Menu.
17. At Hardware Profile/Configuration Recovery Menu press <Enter> to boot to Windows NT Workstation Setup (Sysprep) screen.

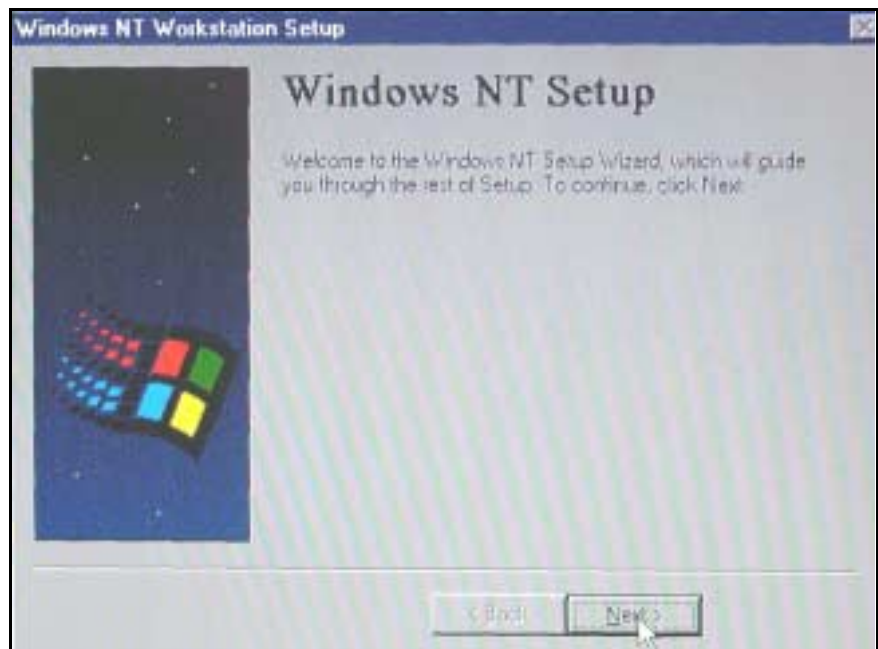


Figure 4-10 Setup screen

18. At “Windows NT Workstation Setup” screen (see [Figure 4-10](#)) click *Next*.

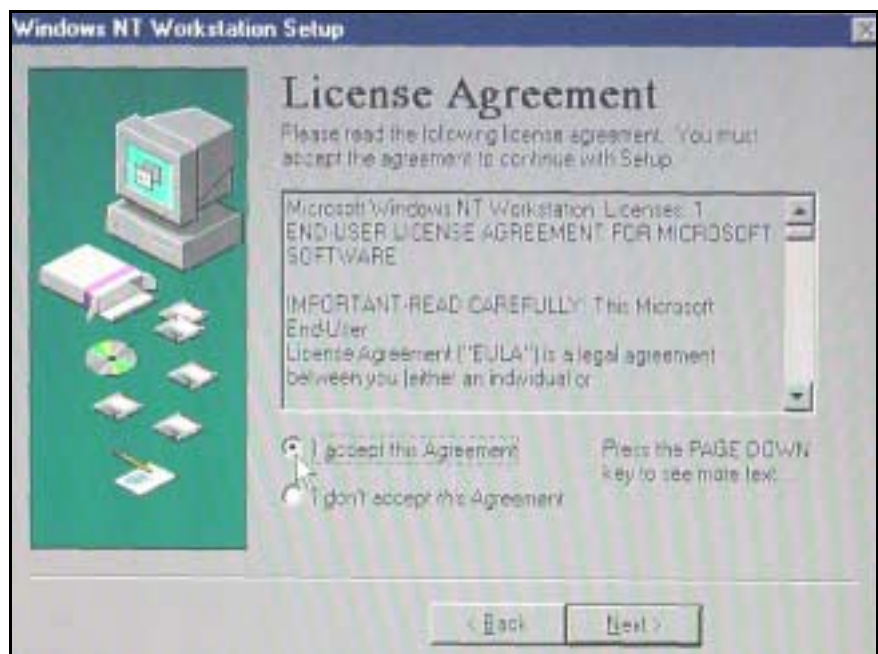


Figure 4-11 License Agreement screen

19. At “License Agreement” screen (see [Figure 4-11](#)) click on “I accept this Agreement”, then click on *Next*.

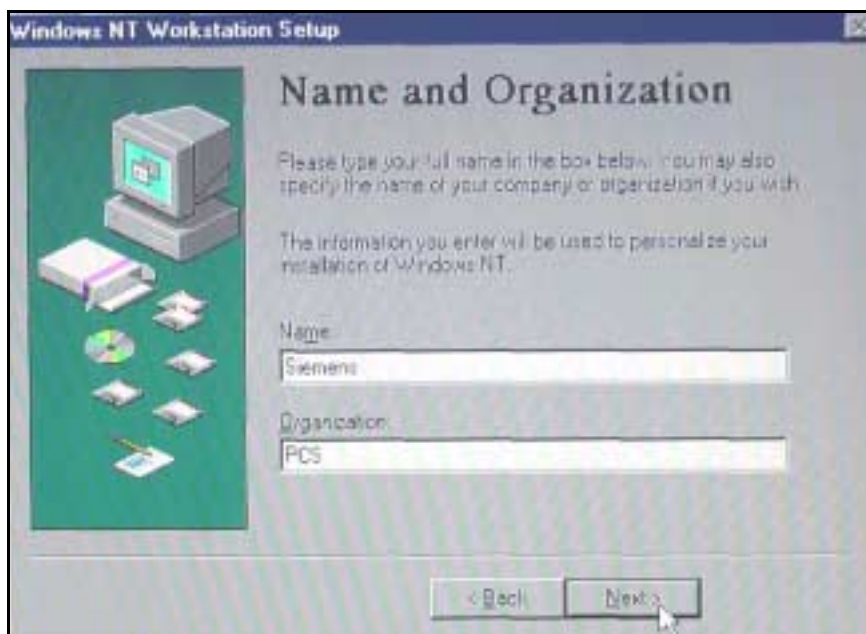


Figure 4-12 Name and Organization screen

20. At “Name and Organization” screen (see [Figure 4-12](#)), type in Company or Hospital name in “Name” box, and Company or Hospital Organization in “Organization” box, and then click *Next*.
21. Proceed to step 21 if using English version of Windows NT. Otherwise at “Registration” screen type Product ID# in blank boxes, and then click *Next*.

Note: Product ID# is located on Microsoft label at side panel of MDS.



Figure 4-13 Computer Name screen

22. At “Computer Name” screen (see [Figure 4-13](#)) type in a unique name

(15 characters or less) for this MDS, then click on *Next*.

Note: If this MDS is used in a network, it is imperative that it has a unique name. Network problems occur if 2 or more MDS's share an identical name.



Figure 4-14 Administrator screen

23. At "Administrator Account" screen (see [Figure 4-14](#)), type a password (14 characters or less) in "Password" box, then re-type same password in "Confirm Password" box, and then click on *Next*.

Note: If password has not been defined for this MDS, leave boxes empty and click *Next*.



Figure 4-15 Windows NT Setup screen

24. At "Windows NT Setup" screen (see [Figure 4-15](#)) click *Finish*.

25. Verify MDS reboots to OS loader V4.00 screen.

26. Press <Enter> and follow instructions on screen to complete NT4 Sysprep Utility.

Note: MDS reboots after NT4 Sysprep Utility is complete.

4 Phoenix BIOS Phlash

Each MDS is shipped with a default BIOS switch installed at the factory. Phlashing BIOS is necessary only if current MDS BIOS is not operating correctly or if an updated version is needed to correct MDS system failures. If original BIOS is not operating correctly, complete [Section 2.2](#) before Phlashing BIOS. If [Section 2.2](#) fails to correct problem, Phlash BIOS as described below.

BIOS Phlash files are distributed in 4 formats:

- Existing Phlash files on MDS hard drive.
- Phlash files on MDS Software CDROM (shipped with each MDS).
- Upgrade Phlash files ordered from factory.
- Upgrade Phlash files downloaded from EM location on MED-TD site (www-td.med.siemens.de).

Setup MDS to phlash the MDS BIOS as described in [Section 4.1](#) and [Section 4.2](#) below.

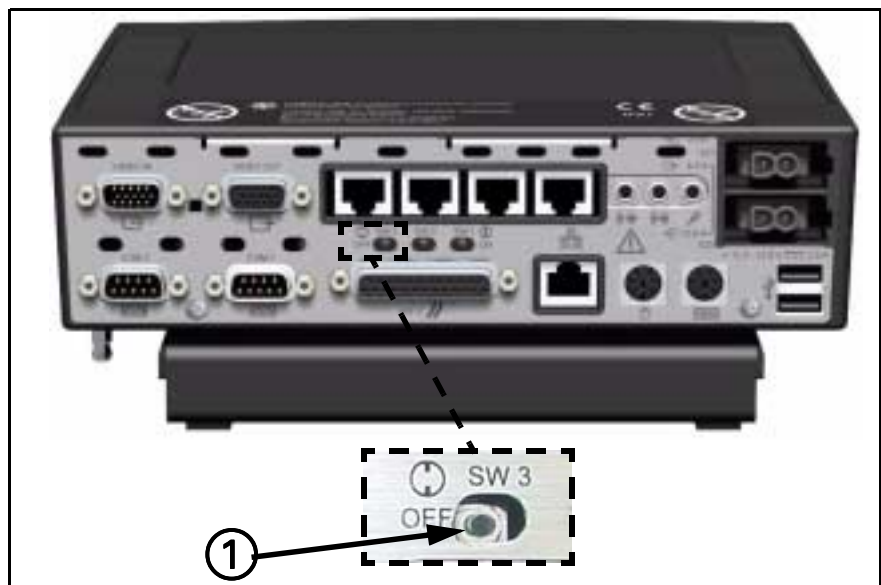


Figure 4-1 MDS (rear view)

4.1 Hardware Setup

Verify that BIOS switch (see ① in insert in [Figure 4-1](#)) on rear of MDS is set to right.

4.2 Software Setup

Copy Phlash software to MDS hard drive according to [Section 4.2.1](#) for CDROM or [Section 4.2.2](#) below, if downloading from laptop.

4.2.1 CDROM Setup Procedure

Use this procedure to load Phlash software from MDS CDROM (shipped with MDS), or Phlash Upgrades distributed on CDROM (ordered from Factory).

1. Insert MDS CDROM into Service Laptop.
2. Configure service laptop for network boot according to [Section 3.1](#) through [Section 3.4](#).

```

The command completed successfully.

A:\>c:
C:\>md phlash
C:\>x:
X:\>copy phlash c:\plash
PHLASH\PHLASH.EXE
PHLASH\ZEUS_828.ROM
PHLASH\PLATFORM.BIN
3 file(s) copied
X:\>

```

Figure 4-2 DOS Window

3. At DOS A:> Phlash prompt, type **C:** (① in Figure 4-1) and press <Enter>.
4. At DOS C:> prompt, type **md^plash** (② in Figure 4-1) and press <Enter>.
- Note: If message "A subdirectory or file phlash already exists" appears, press <Enter>.
5. At DOS C:> prompt, type **x:** (③ in Figure 4-1) and press <Enter>.
6. At DOS X:> prompt, type **copy^plash^c:\plash** (④ in Figure 4-1) and press <Enter>.

Note: If message "Overwrite C:\PHLASH\PHLASH.Exe (Yes/NO/All) appears, type **A** and press <Enter>.

7. Verify that the following files scroll up the screen:
 - Phlash\Phlash.exe
 - Phlash\Zeus_XXX.rom
 - Phlash\platform.bin
- 3 file(s) copied
8. At DOS X:> prompt, press Ctrl+Alt+Delete keys to reboot system.
9. Press F2 key and set BIOS for Hard drive boot. See step 2 and 3 of Section 3.4.

10. Complete MDS Hard Drive Phlash Procedure. See Section 4.3.

4.2.2 Download Setup Procedure

For Phlash upgrade using Electronic format go to TD Website (www-td.med.siemens.de).

1. Select Product Information→EM System→PCS→ Software PCS→ MDS. Download MDS Phlash directory from TD website and save files to Service Laptop "C:\plash" directory.
2. Configure laptop for network boot according to Section 3.1 through step 7 of Section 3.4.

Note: In Section 3.1.2, configure file sharing for (C:) drive instead of

CDROM drive. At step 3 of [Section 3.1.2](#) type **C** in “Share Name” box.

3. At MDS DOS A:> Phlash prompt type **C**: (① in [Figure 4-1](#)) and press <Enter>.

4. At MDS DOS C:> prompt, type **md^plash** (② in [Figure 4-1](#)) and press <Enter>.

Note: If message “a subdirectory or file phlash already exists” appears, press <Enter>.

5. At MDS DOS C:> prompt, type **x**: (③ in [Figure 4-1](#)) and press <Enter>.

6. At MDS DOS X:> prompt, type **copy^plash^c:\plash** (④ in [Figure 4-1](#)) and press <Enter>.

Note: If message “Overwrite C:\PHLASH\PHLASH.Exe (Yes/NO/All) appears, type **A** and press <Enter>.

7. Verify that the following files scroll up the screen:

- Phlash\Phlash.exe
- Phlash\Zeus_XXX.rom
- Phlash\platform.bin

1 file(s) copied

8. At DOS X:> prompt, Ctrl+Alt+Delete keys to reboot system.

9. Press F2 key and set BIOS for Hard drive boot (see step 2 and step 3 of [Section 3.4](#)).

10. Complete MDS Hard Drive Phlash Procedure. See [Section 4.3](#).

4.3 MDS Hard Drive Phlash Procedure

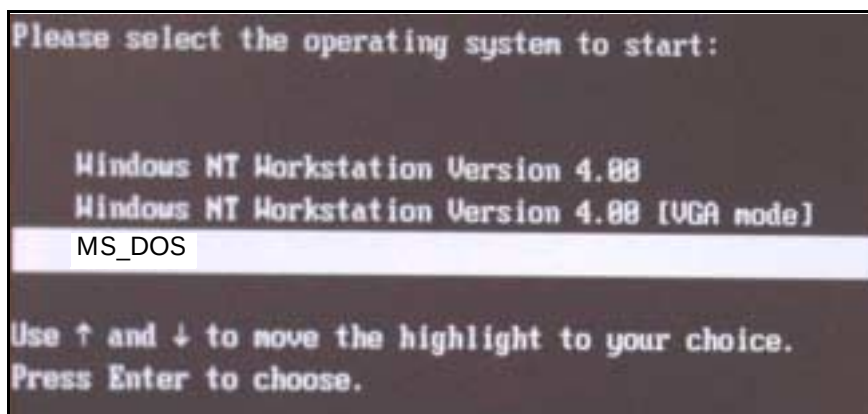


Figure 4-3 NT Boot loader window

1. Switch MDS Power On/Off switch to On, to boot MDS to Boot Loader screen.

Note: Do not attempt to complete this operation by entering DOS through the Windows environment.

2. Using keyboard up/down arrows, select **MS-DOS** (as shown in [Figure 4-3](#)).
3. Press <Enter>, then immediately press and hold F5 key.

```

Starting MS-DOS...

MS-DOS is bypassing your CONFIG.SYS and AUTOEXEC.BAT files.

Microsoft(R) MS-DOS(R) Version 6.22
(C)Copyright Microsoft Corp 1981-1994.

C:\>cd phlash
C:\PHLASH>plash zeus_828.rom_

```

Figure 4-4 Boot window

4. Verify that message "MS-DOS is bypassing your config.sys and autoexec.bat files" is displayed. If message is not displayed repeat step 1 and 2 until message is displayed.
5. At DOS C:> prompt, type **cd ^plash** and press <Enter>.
6. At DOS C:> PHLASH prompt, type **dir** and press <Enter>.
7. Verify that the following files appear in the phlash directory:
 - Phlash.exe
 - Platform.bin
 - Zeus_XXX.ROM

Note: XXX indicates this ROM update version (e.g xxx=020 for ROM).

8. At DOS C:> PHLASH prompt, type **plash ^zeus ^XXX.rom** (where xxx=ROM version displayed in step 6) and press <Enter>.

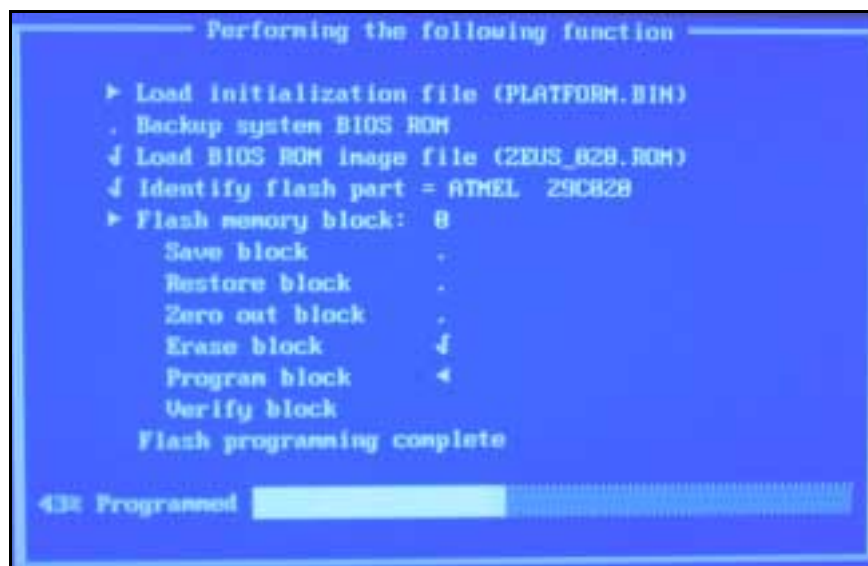


Figure 4-5 Phlash program

9. Verify that Phlash program begins loading new BIOS version (see [Figure 4-5](#)).

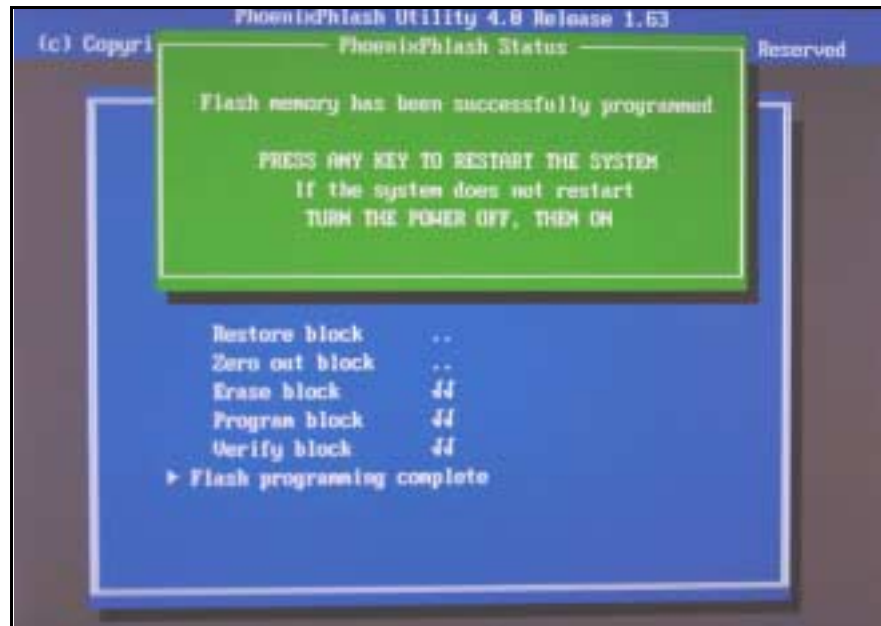


Figure 4-6 Phlash Window

10. Once Phlash program is completed, verify message “Phlash memory has been successfully programmed” is displayed in PhoenixPhlash Status box (see [Figure 4-6](#)).

Note: If message is not displayed, repeat steps 1-6.

11. Power-down MDS.
12. Power-up MDS and press and hold *F2* key until BIOS screen appears.
13. At “Main” tab of PhoenixBIOS Setup Utility screen, verify that new BIOS version is displayed at right side of “BIOS Version:”.
14. Press *F9* key, and then press <Enter> to install BIOS default settings.
15. Press *F10* key, and then press <Enter> to save and exit BIOS.

5 Replacement Procedures

5.1 Opening MDS

Caution:

The MDS contains PC boards that can be affected by static discharge. Work in a static-protected environment.

1. Remove all cables attached to MDS.



Figure 5-1 MDS top view

2. Set MDS upright on clean surface.
3. Remove and save 6 Phillips-head screws (① in [Figure 5-1](#)) that hold top cover to MDS.
4. Remove top cover and set aside.
5. Set MDS upside down on clean surface.



Figure 5-2 MDS (bottom view)

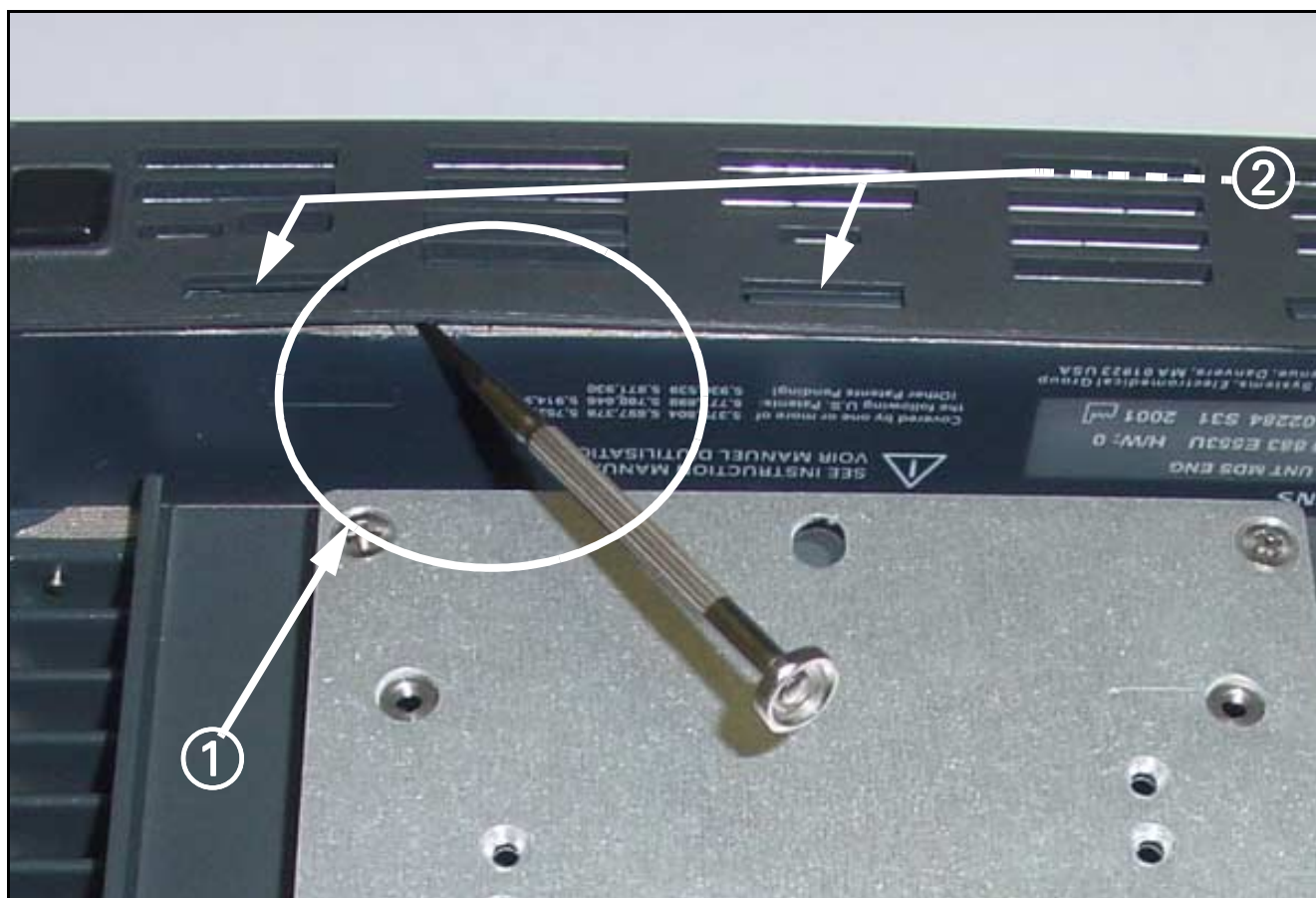


Figure 5-3 MDS exploded bottom view front panel

6. Insert small blade screwdriver between front panel and chassis of MDS (as shown at ① in Figure 5-2 and in Figure 5-3 “exploded view”), close to each of three panel locking tabs indicated by ② in Figure 5-2, and carefully lift up on screwdriver to release front panel from each locking tab (② in Figure 5-2 and in Figure 5-3 “exploded view”), and then pull front panel out so that tabs cannot reset.
7. Remove and set front panel aside.

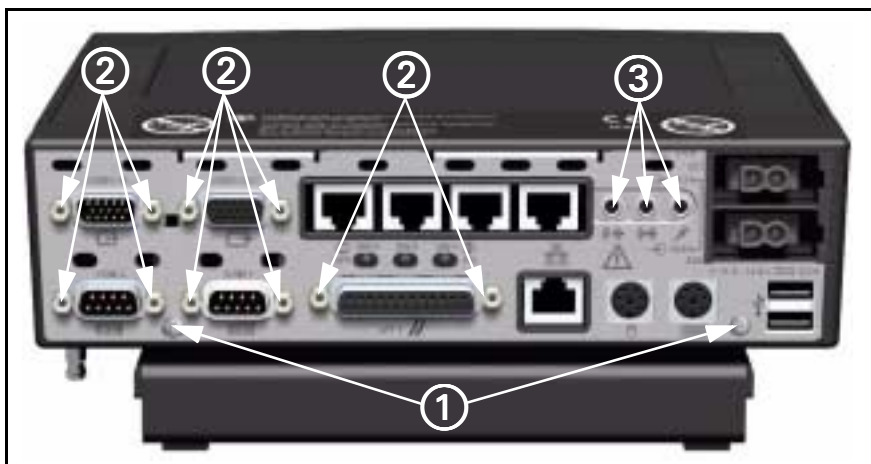


Figure 5-4 MDS rear view

8. Set MDS upright on clean surface.
9. Remove and save 2 Phillips-head screws (① in Figure 5-4), ten posts (② in Figure 5-4) and three nuts on auxiliary jacks (③ in Figure 5-4) that secure rear panel to MDS.
10. Remove rear panel and set aside.

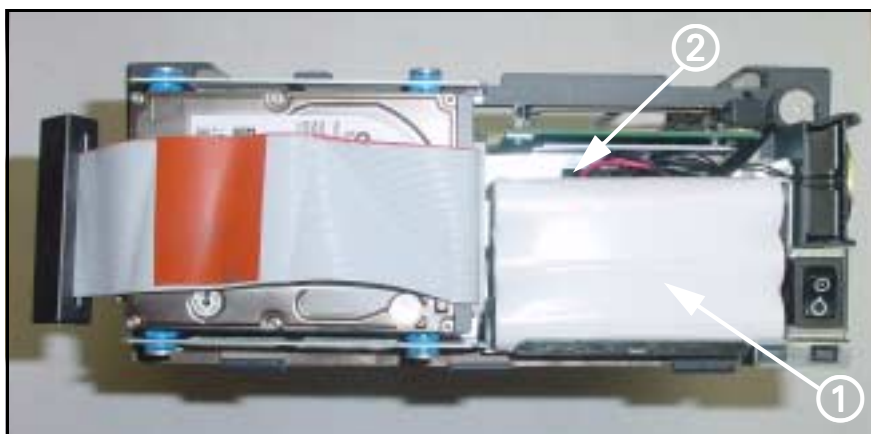


Figure 5-5 Front Panel battery

5.2 Replacing Battery

11. Lift up and then pull battery (① in Figure 5-5) out of front panel housing to gain access to battery connector (② in Figure 5-5).
12. Pull out battery connector, and then remove and set battery aside.

Note: Note polarity of battery cable for reference when reassembling MDS.

5.3 Replacing Hard Drive



Figure 5-6 MDS (top cover removed)

1. Set MDS upright on clean surface.
2. Unplug ribbon cable connector (① in [Figure 5-6](#)) from motherboard, and fold back.

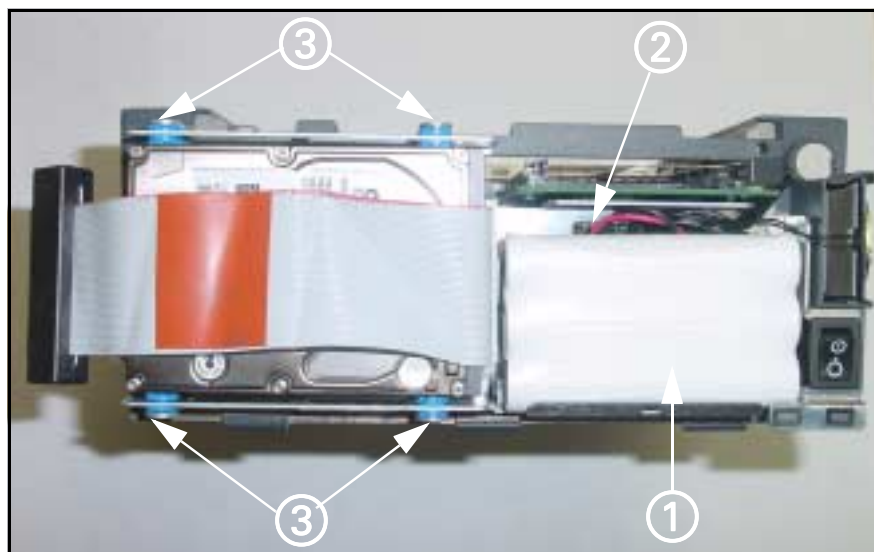


Figure 5-7 MDS (front view)

3. Remove and save 4 Phillips-head screws and sleeves (③ in [Figure 5-7](#)) that secure primary hard drive to top and bottom of front housing.
4. Remove hard drive from front housing, disconnect ribbon cable, and set hard drive on flat clean surface.
5. Align pins on hard drive to ribbon cable connector, and carefully press into place.

Note: Ribbon cable connector is keyed and can only be inserted on the hard drive in one orientation.

6. Insert hard drive into front housing and secure with screws removed in step 5 above.
7. Follow procedure of [Section 5.3](#) in reverse order to reassemble MDS, and then proceed to [Section 5.5](#).

5.4 Replacing Memory / Daughterboard

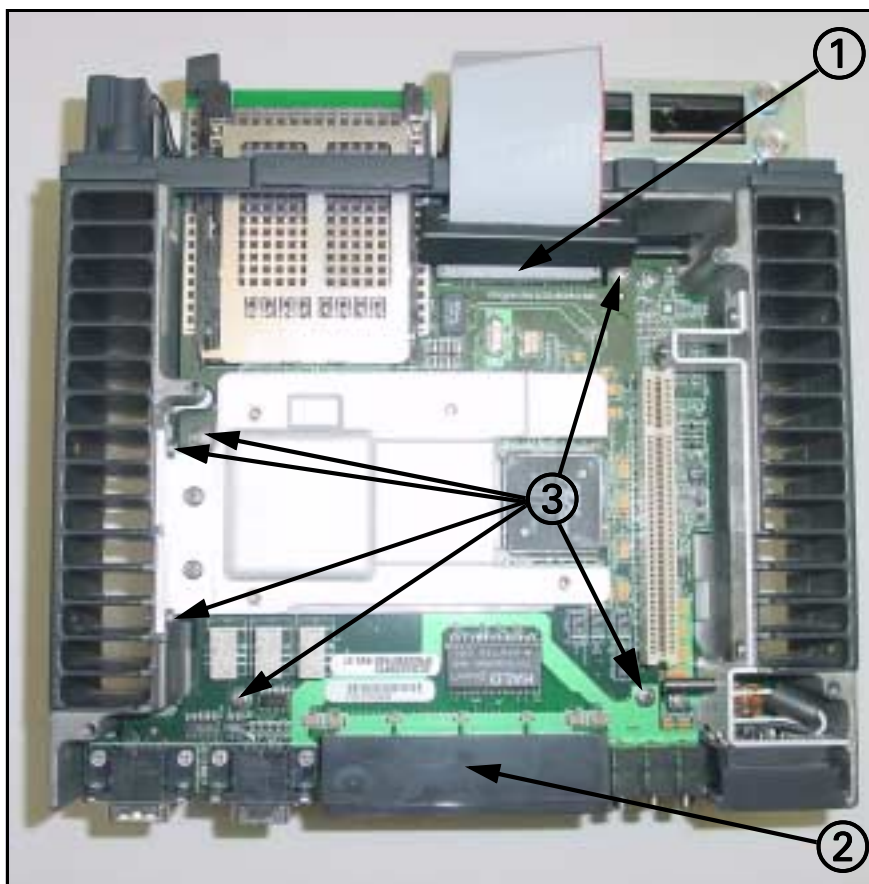


Figure 5-8 MDS (top cover removed)

1. Unplug ribbon cable connector (① in [Figure 5-8](#)) from mother board, and fold back.
2. Remove and save plastic ethernet cover (② in [Figure 5-8](#)).
3. Remove and save 6 Phillips-head screws (③ in [Figure 5-8](#)) that secure daughter board to mother board.
4. Lift daughter board up to separate from mother board, slide board slightly to right to separate from PCMCIA guide slot, and then pull board toward rear of MDS to remove board.
5. Do either a, b, or c, as appropriate.
 - a) If replacing daughter board, locate replacement board in position on MDS and perform steps 4 - 1 above in reverse to reassemble unit. Then proceed to [Section 5.5](#).
 - b) If replacing memory module, go to [step 6](#).

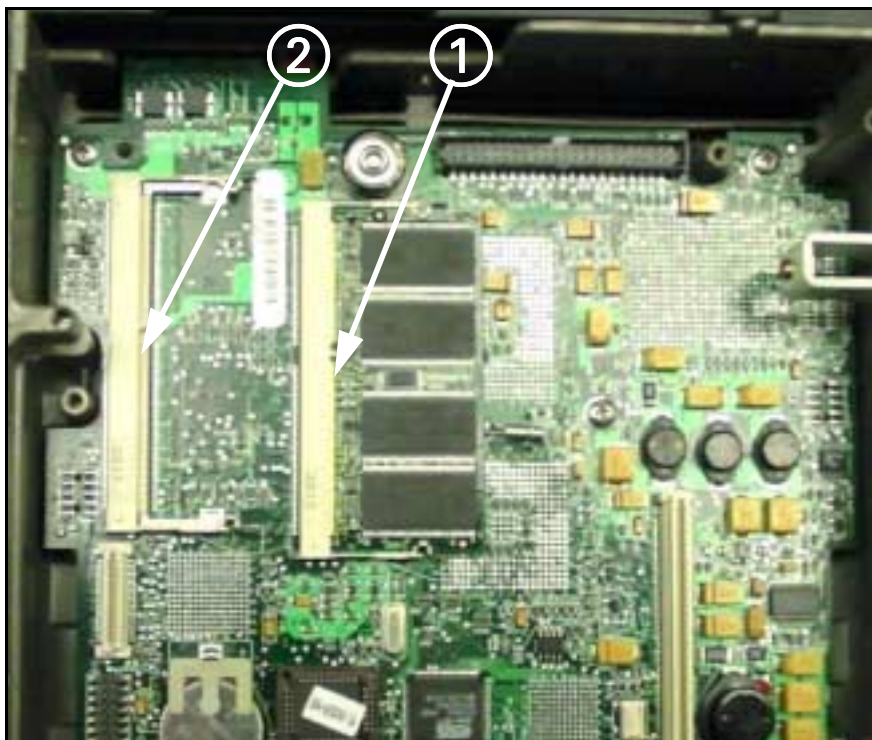


Figure 5-9 Memory slots

6. Lift defective memory module ① or ② (not installed in Figure 5-9) out of memory slot and remove module.
 7. Align pins on replacement memory module to connector on motherboard (① or ② in [Figure 5-9](#)).
 8. Carefully seat memory module into connector, and then press down to lock into place.
- Note: Memory module is slotted and can only be inserted in only one orientation, and snaps into place when properly installed.
9. Locate daughter board in position on MDS and perform steps 4 - 1 above in reverse to reassemble unit.
 10. Proceed to [Section 5.5](#).

5.5 Closing MDS

1. Set MDS upright on clean surface.
 2. Align screw holes on rear panel to screw holes on back of MDS.
 3. Insert and tighten 2 Phillips-head screws removed in step 8 of [Section 5.1](#).
 4. Insert and tighten 10 post removed in step 9 of [Section 5.1](#).
 5. Insert and tighten 3 nuts removed in step 10 of [Section 5.1](#).
 6. Extend PCMCIA eject button out, so that front panel can be installed.
 7. Align tab slots on front panel to tabs on bottom of MDS, and carefully press front panel into place.
- Note: Tabs snap into place when properly installed.
8. Align screw holes on top cover to screw holes on MDS.

9. Insert and tighten 6 Phillips-head screws removed in step 3 of [Section 5.1](#).
10. Proceed to [Section 6](#),

6 Functional Check

The following procedures check the MDS's hard drive, memory, power circuits, power-up sequence, power indicator, and software. Begin the procedure with the MDS powered off. Record all values in "[Functional Verification Checklist](#)" on page 37. Retain a copy of test results with your records.

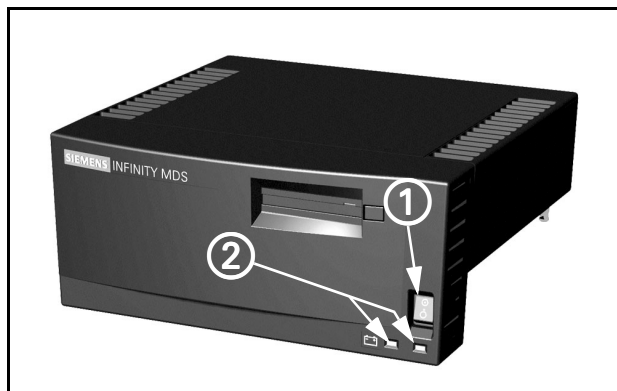


Figure 6-1 MDS (front view)

1. Connect cables removed from MDS during step 1 of [Section 2.1](#)
2. Power up MDS, and press and hold down F2 key to enter Bios setup.

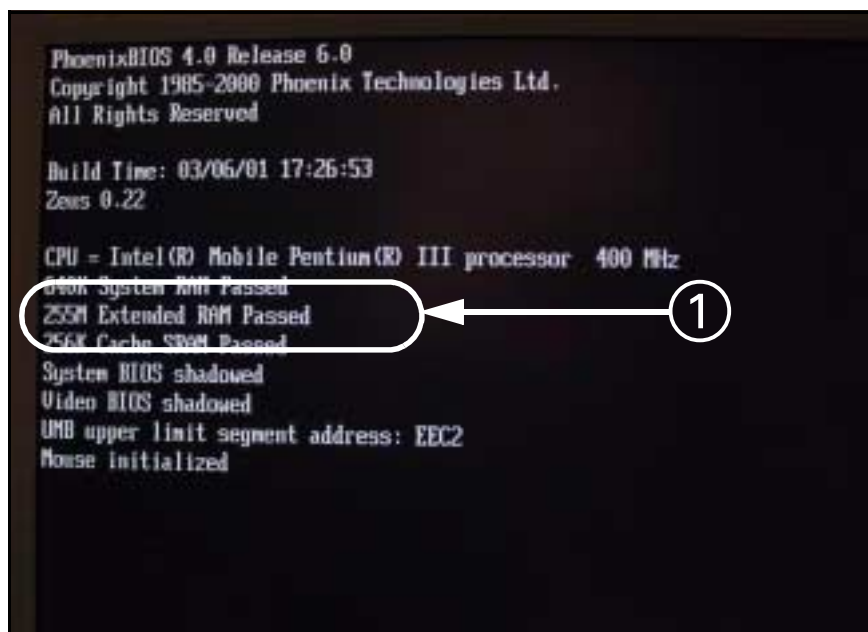


Figure 6-2 Boot-Up Self-Test Screen

3. During boot up, verify memory test passes (① in [Figure 6-2](#)).

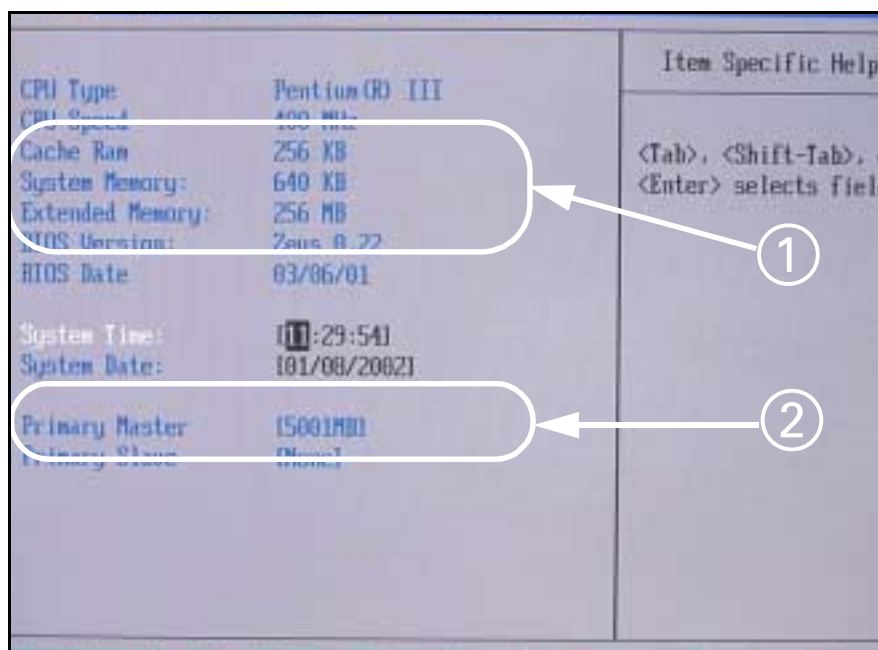


Figure 6-3 PhoenixBIOS Utility Screen

4. At "MAIN" tab of PhoenixBIOS setup utility screen verify the following:
 - 4.1) Cache Ram, System Memory and Extended memory are as shown by ① in Figure 6-3.
 - 4.2) Primary Master drive capacity is displayed (② in Figure 6-3).
5. Press F10 key then press <Enter> to save and exit PhoenixBIOS Utility menu.
6. Verify two power LED's on front panel illuminate green (② in Figure 6-1), Medside Data Station emits a brief tone, and monitor display begins boot sequence.
7. Verify MDS boots to OS loader screen.
8. Using Up/Down arrows select *Windows NT Workstation Version 4.00* and press <Enter>.

Note: If no selection is made, this screen times out in 25 seconds and then boots to Hardware Profile/Configuration Recovery Menu.
9. At Hardware Profile/Configuration Recovery Menu press <Enter> to boot to NT4 Login Window.

Note: If NT Login Window does not appear, reboot MDS.
10. At OS Loader screen select *Windows NT Workstation 4.00 [VGA mode]* and press <Enter>.
11. At NT4 Login Window, press Ctrl+Alt+Delete to Login.
12. Click on OK at Login information windows to boot to "MAIN" screen.

Note: Do not enter name or password.
13. Verify that correct language appears on Windows NT Workstation main screen.

14. Perform leakage current test and functionally verify proper operation of reassembled MDS before returning MDS to clinical service.
Proceed to [Section 7](#).

7 FLeakage Current Test

Leakage current tests assure that under both normal and fault conditions, any leakage current does not exceed values given in [Table 7-1](#).

1. Perform leakage test with MDS power supply plugged into leakage tester. See [Figure 7-1](#).

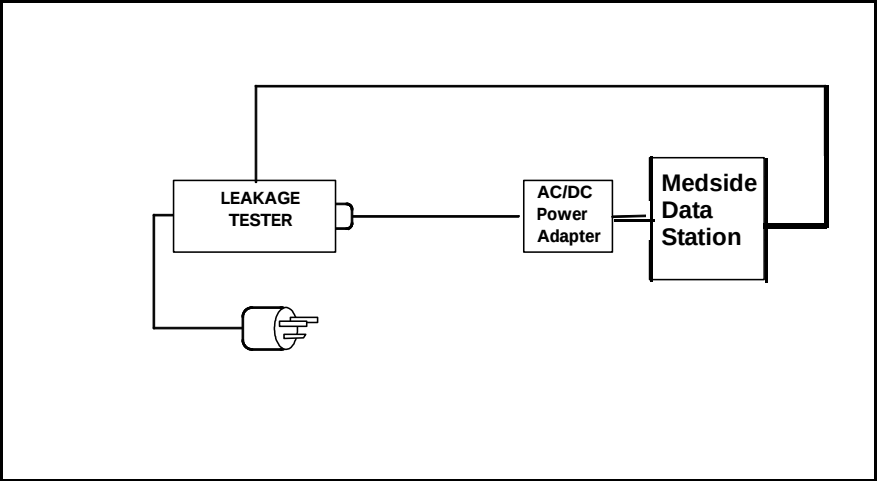


Figure 7-1 MDS Earth leakage current test setup

2. Follow leakage tester manufacture’s instructions to measure each of leakage currents given in [Table 7-1](#).
- Earth leakage
 - Enclosure leakage (case)

Table 7-1Leakage Current Test

TEST	Max. Current
Earth Leakage	.5ma@240VAC .250ma@120VA
Enclosure leakage (case)	.1ma@240VAC .05ma@120VAC

3. Verify that current does not exceed values given in [Table 7-1](#).
4. Record all values in “[Functional Verification Checklist](#)” on page [37](#)

Functional Verification Checklist

Site: _____ Date: _____ Technician: _____

Location: _____ MDS Serial Number: _____ Installed SW Version: _____

File a copy of this report with site documentation, and retain a copy for your records. The Siemens RG may also require a copy of these test results. For MDS's serviced in U.S.A., also forward copy of completed Functional Verification Checklist per applicable SSG installation procedure.

✓ = Test Passed

Power Circuits and Startup

- Power LEDs _____
- Brief tone _____
- OS loader screen _____
- Correct language _____

Hard Drive

256MB Memory

- Boot up _____
- BIOS Utility screen _____

Leakage Current Test

- Earth leakage _____
- Enclosure leakage (case) _____

MDS has passed all required tests.

Name Printed

Signature

Date

This page intentionally left blank.

Appendix A: Spare Parts

Table A-1Spare Parts

Part Art. No.	Part Name	Dwg. Ref.
72 59 257 E553U	Drive Cable	Figure A-1 on page 40
72 65 627 E553U	128M Memory Module	Figure A-2 on page 40
72 59 869 E533U	E/M ASY CBL FRNT PANEL MDS	Figure A-3 on page 40
72 62 046 E553U	PCB ASY Daughterboard	Figure A-4 on page 41
72 59 307 E553U	Battery Module	Figure A-5 on page 41
72 58 812 E553U	MEC PRT CVR Front MDS	Figure A-6 on page 42
72 59 851 E553U	E/M ASY OFF/ON SWITCH	Figure A-7 on page 42
72 65 619 E553U	EM SPR MDS Hard Drive	Figure A-8 on page 42

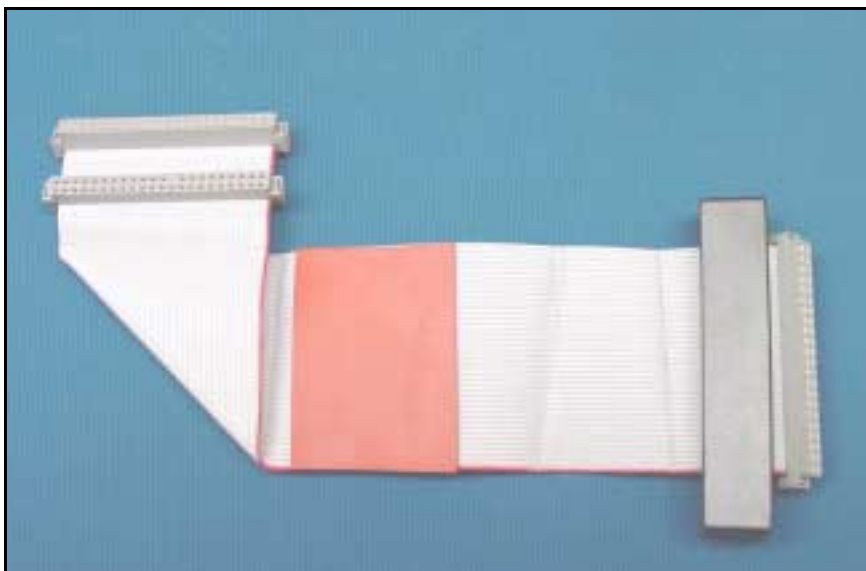


Figure A-1 Drive Cable



Figure A-2 128M Memory Module



Figure A-3E/M ASY CBL FRNT PANEL MDS

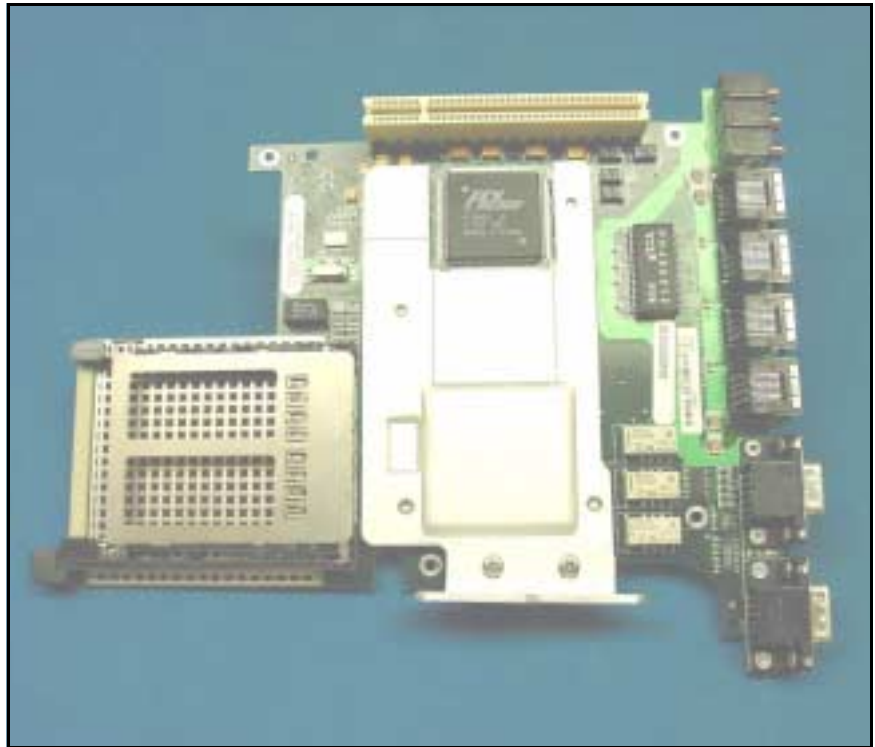


Figure A-4 PCB ASY DAUGHTERBOARD



Figure A-5 Battery Module



Figure A-6 MEC PRT CVR FRONT MDS



Figure A-7 E/M ASY OFF/ON SWITCH



Figure A-8 EM SPR MDS Hard Drive

Appendix B: Bios Messages

The following is a list of the messages that the BIOS displays. Most error messages occur during POST test. See “Appendix C: POST Error Codes” on page 47. Some messages display information about a hardware device, e.g., the amount of memory installed. Other messages may indicate a problem with a device, such as the way it has been configured. The following list of messages includes explanations of error messages and possible remedies for reported problems.

If your system displays one of the messages marked below with an asterisk (), write down the message and contact TSS Danvers or TSS Solna. If the MDS fails after making changes in the BIOS Setup menus, reset the computer, enter BIOS Setup and verify Setup (see [Section 3](#)) to correct the error.

0200 Failure Fixed Disk

Fixed disk is not working or not configured properly. Check to see if fixed disk is attached properly. Run BIOS Setup. Find out if the fixed-disk type is correctly identified (see [Section 3.1](#)).

0210 Stuck key

Stuck key on keyboard.

0211 Keyboard error

Keyboard not working.

*0212 Keyboard Controller Failed

Keyboard controller failed test. May require replacing keyboard controller.

0213 Keyboard locked - Unlock key switch

Unlock the system to proceed.

0220 Monitor type does not match CMOS - Run SETUP

Monitor type not correctly identified in Setup

*0230 Shadow Ram Failed at offset: nnnn

Shadow RAM failed at offset **nnnn** of the 64k block at which the error was detected.

*0231 System RAM Failed at offset: nnnn

System RAM failed at offset **nnnn** of in the 64k block at which the error was detected.

*0232 Extended RAM Failed at offset: nnnn

Extended memory not working or not configured properly at offset **nnnn**.

*0250 System battery is dead - Replace and run SETUP

The CMOS clock battery indicator shows the battery is dead.

0251 System CMOS checksum bad - Default configuration used

System CMOS has been corrupted or modified incorrectly, perhaps by an application program that changes data stored in CMOS. The BIOS installed Default Setup Values. If you do not want these values, enter Setup and enter correct values (see [Section 3.1](#)). If the error persists, contact TSS Danvers/Solna.

***0260 System timer error**

The timer test failed. Requires repair of system board.

***0270 Real time clock error**

Real-Time Clock fails BIOS hardware test. May require board repair.

0271 Check date and time settings

BIOS found date or time out of range and reset the Real-Time Clock. May require setting legal date (1991- 2099).

0280 Previous boot incomplete - Default configuration used

Previous POST did not complete successfully. POST loads default values and offers to run BIOS Setup. If the failure was caused by incorrect values and they are not corrected, the next boot will likely fail. On systems with control of **wait states**, improper Setup settings can also terminate POST and cause this error on the next boot. Run Setup and verify that the wait-state configuration is correct. This error is cleared the next time the system is booted.

***0281 Memory Size found by POST differed from CMOS**

Memory size found by POST differed from CMOS.

***02B2 Incorrect Drive A type - run SETUP**

Type of floppy drive A: not correctly identified in Setup. Contact TSS Danvers/Solna.

***02B3 Incorrect Drive B type - run SETUP**

Type of floppy drive B: not correctly identified in Setup. Contact TSS Danvers/Solna.

02D0 System cache error - Cache disabled

RAM cache failed and BIOS disabled the cache. A disabled cache slows system performance considerably. Contact TSS Danvers/Solna.

***02F0: CPU ID:**

CPU socket number for Multi-Processor error.

***02F4: EISA CMOS not writeable**

ServerBIOS2 test error: Cannot write to EISA CMOS.

***02F5: DMA Test Failed**

ServerBIOS2 test error: Cannot write to extended **DMA** (Direct Memory Access) registers.

***02F6: Software NMI Failed**

ServerBIOS2 test error: Cannot generate software NMI (Non-Maskable Interrupt).

***02F7: Fail-Safe Timer NMI Failed**

ServerBIOS2 test error: Fail-Safe Timer takes too long.

Device Address Conflict

Address conflict for specified **device**.

Allocation Error for: device

Run ISA or EISA Configuration Utility to resolve resource conflict for the specified device.

***CD ROM Drive**

CD ROM Drive identified.

Entering SETUP...

Starting Setup program

***Failing Bits: nnnn**

The hex number **nnnn** is a map of the bits at the RAM address which failed the memory test. Each 1 (one) in the map indicates a failed bit. See errors 230, 231, or 232 above for offset address of the failure in System, Extended, or Shadow memory.

Fixed Disk n

Fixed disk **n** (0-3) identified.

Invalid System Configuration Data

Problem with NVRAM (CMOS) data.

I/O device IRQ conflict

I/O device IRQ conflict error.

PS/2 Mouse Boot Summary Screen:

PS/2 Mouse installed.

nnnn kB Extended RAM Passed

Where **nnnn** is the amount of RAM in kilobytes successfully tested.

nnnn Cache SRAM Passed

Where **nnnn** is the amount of system cache in kilobytes successfully tested.

nnnn kB Shadow RAM Passed

Where **nnnn** is the amount of shadow RAM in kilobytes successfully tested.

nnnn kB System RAM Passed

Where **nnnn** is amount of system RAM in kilobytes successfully tested.

One or more I2O Block Storage Devices were excluded from the Setup Boot Menu

There was not enough room in the IPL table to display all installed I2O block-storage devices.

Operating system not found

Operating system cannot be located on drive C:. Enter Setup and see if fixed disk properly identified.

***Parity Check 1 nnnn**

Parity error found in the system bus. BIOS attempts to locate the address and display it on the screen. If it cannot locate the address, it displays **????**. Parity is a method for checking errors in binary data. A parity error indicates that some data has been corrupted.

Parity Check 2 nnnn

Parity error found in the I/O bus. BIOS attempts to locate the address and display it on the screen. If it cannot locate the address, it displays **???**.

Press <F1> to resume, <F2> to Setup, <F3> for previous

Displayed after any recoverable error message. Press <F1> to start the boot process or <F2> to enter Setup and change the settings. Press <F3> to display the previous screen (usually an initialization error of an **Option** ROM, i.e., an add-on card). Write down and follow the information shown on the screen.

Press <F2> to enter Setup

Optional message displayed during POST.

PS/2 Mouse:

PS/2 mouse identified.

Run the I2O Configuration Utility

One or more unclaimed block storage devices have the Configuration Request bit set in the LCT. Run an I2O Configuration Utility (e.g. the SAC utility).

System BIOS shadowed

System BIOS copied to shadow RAM.

UMB upper limit segment address: nnnn

Displays the address *nnnn* of the upper limit of **Upper Memory Blocks**, indicating released segments of the BIOS which can be reclaimed by a virtual memory manager.

Video BIOS shadowed

Video BIOS successfully copied to shadow RAM.

Appendix C: POST Error Codes

Recoverable POST Errors	Whenever a recoverable error occurs during POST, PhoenixBIOS displays an error message describing the problem.
Terminal POST Errors	There are several POST routines that issue a POST Terminal Error message and shut down the system if the routines fails. Before shutting down the system, the terminal-error handler issues a beep code signifying the test point error, writes the error to port 80h, attempts to initialize the video, and writes the error in the upper left corner of the screen (using both mono and color adapters).
Test Point Error Code	At the beginning of each POST routine, the BIOS outputs the test point error code to I/O address 80h. Use this code during trouble shooting to establish at what point the system failed and what routine was being performed. If external hardware error is displayed, (eg.mouse, keyboard, etc.) Check external hardware and hardware connections, then reboot MDS. If other errors are displayed, write down error code and contact TSS Danvers/Solna. If the BIOS detects a terminal error condition, it halts POST and attempts to display the error code on upper left corner of the screen.

If the system hangs before the BIOS can process the error, the value displayed at the port 80h is the last test performed. In this case, the screen does not display the remaining error code.

The following is a list of the checkpoint codes displayed and written at the start of each test, and the beep codes issued for terminal errors. Unless otherwise noted, these codes are valid for PhoenixBIOS 4.0 Release 6.x.

Table C-1 Checkpoint codes

Code	POST Routine Description
02h	Verify Real Mode
03H	Disable Non-Maskable Interrupt (NMI)
04h	Get CPU type
06h	Initialize system hardware
07h	Disable shadow and execute code from ROM
08h	Initialize chipset with initial POST values
09h	Set IN POST flag
0Ah	Initialize CPU registers
0Bh	Enable CPU cache
0Ch	Initialize cache to initial POST values
0Eh	Initialize I/O component
0Fh	Initialize the local bus IDE
10h	Initialize Power Management
11h	Load alternate registers with values POST values
12h	Restore CPU control word during warm boot
13h	Initialize PCI Bus Mastering devices

Table C-1 Checkpoint codes (Continued)

14h	Initialize keyboard controller
16h	BIOS ROM checksum
17h	Initialize cache before memory Auto size
18h	8254 timer initialization
1Ah	8237 DMA controller initialization
1Ch	Reset Programmable Interrupt Controller
20h	Test DRAM refresh
22h	Test 8742 keyboard controller
24h	Set ES segment register to 4 GB
28h	Auto size DRAM
29h	Initialize POST Memory Manager
2Ah	Clear 512kb base RAM
2Ch	RAM failure on address line xxxx
2EH	RAM failure on address line xxxx* of low byte of memory bus
2Fh	Enable cache before system BIOS shadow
32h	Test CPU bus-clock frequency
33h	Initialize Phoenix Dispatch Manager
36h	Warm start shut down
38h	Shadow system BIOS ROM
3Ah	Auto size cache
3Ch	Advanced configuration of chipset registers
3Dh	Load alternative registers with CMOS values
41h	Initialize extended memory for RomPilot
42h	Initialize interrupt vectors
45h	POST device initialization
46h	Check ROM copyright notice
47h	Initialize I20 support
48h	Check video configuration against CMOS
49h	Initialize PCI bus devices and devices
4Ah	Initialize all video adapters in system
4Bh	QuietBoot start (optional)
4Ch	Shadow video BIOS ROM
4Eh	Display BIOS copyright notice
4Fh	Initialize MultiBoot
50h	Display CPU type and speed
51h	Initialize EISA board
52h	Test Keyboard
54h	Set key click if enabled
55h	Enable USB devices
58h	Test for unexpected interrupts
59h	Initialize POST display
5Ah	Display prompt "Press F2 to enter SETUP"
5Bh	Display CPU cache
5Ch	Test RAM between 512 and 640 kb

Table C-1 Checkpoint codes (Continued)

60h	Test extended memory
62h	Test extended memory address line
64h	Jump to User Patch1
66h	Configure advanced cache register
67h	Initialize Multi Processor APIC
68h	Enable external and CPU caches
69h	Setup System Management Mode (SSM) area
6Ah	Display external L2 cache size
6Bh	Load custom defaults (optional)
6Ch	Display shadow-area message
6Eh	Display possible high address for UMB recovery
70h	Display error messages
72h	Check for configuration errors
76h	Check for keyboard errors
7Ch	Setup hardware interrupt vectors
7Dh	Initialize Intelligent System Monitoring
7Eh	Initialize coprocessor if present
80h	Disable on board Super I/O ports and IRQ's
81h	Late POST device initialization
82h	Detect and install external RS232 ports
83h	Configure non-MCD IDE controllers
84h	Detect and install external parallel ports
85h	Initialize PC compatible PnP ISA devices
86h	Re-initialize on board I/O ports
87h	Configure Motherboard Devices
88h	Initialize BIOS Data Area
89h	Enable Non-Maskable Interrupts (NMI's)
8Ah	Initialize Extended BIOS Data Area
8Bh	Test and initialize PS/2 mouse
8Ch	Initialize floppy controller
8Fh	Determine number of ATA drives (optional)
90h	Initialize hard-disk controllers
91h	Initialize local-bus hard-disk controllers
92h	Jump to UserPatch2
93h	Build MPTABLE for multi-processor boards
95h	Install CD ROM for boot
96h	Clear huge ES segment register
97h	Fix up Multi Processor table
98h	Search for optional ROM's. One long, two short beeps on checksum failure
99h	Check for SMART drive (optional)
9Ah	Shadow option ROM's
9Ch	Set up Power Management
9Dh	Initialize security engine (optional)
9Eh	Enable hardware interrupts

Table C-1 Checkpoint codes (Continued)

9Fh	Determine number of ATA and SCSI's drives
A0h	Set time of day
A2h	Check key lock
A4h	Initialize typematic rate
A8h	Erase F2 prompt
AAh	Scan for F2 key stroke
ACH	Enter Setup
Aeh	Clear Boot flag
B0h	Check for errors
B1h	Inform RomPilot about the end of POST.
B2h	POST done - prepare to boot operating system
B4h	One short beep before boot
B5h	Terminate QuietBoot (optional)
B6h	Check password (optional)
B7h	Initialize ACPI BIOS
B9h	Prepare Boot
BAh	Initialize SMBIOS
BBh	Initialize PnP Option ROM "s
BCh	Clear parity checkers
BDh	Display MultiBoot menu
BEh	Clear screen (optional)
BFh	Check virus and backup reminders
C0h	Try to boot with INT 19
C1h	Initialize POST Error Manager (PEM)
C2h	Initialize error logging
C3h	Initialize error display function
C4h	Initialize system error handler
C5h	PnPnd dual CMOS (optional)
C6h	Initialize note dock (optional)
C7h	Initialize note dock late
C8h	Force check (optional)
C9h	Extended checksum (optional)
CAh	Redirect Int 15h to enable remote keyboard
CBh	Redirect Int 13h to Memory Technology Devices such as ROM, RAM, PCMCIA, and serial disk
CCh	Redirect Int 10h to enable remote serial video
CDh	Re-map I/O and memory for PCMCIA
CEh	Initialize digitizer and display message
D2h	Unknown interrupt
The following are for boot block in Flash ROM	
E0h	Initialize the chipset
E1h	Initialize the bridge
E2h	Initialize the CPU
E3h	Initialize system timer
E4h	Initialize system I/O

Table C-1 Checkpoint codes (Continued)

E5h	Check force recovery boot
E6h	Checksum BIOS ROM
E7h	Go to BIOS
E8h	Set Huge Segment
E9h	Initialize Multi Processor
EAh	Initialize OEM special code
EBh	Initialize PIC and DMA
ECh	Initialize Memory type
EDh	Initialize Memory size
EEh	Shadow Boot Block
EFh	System memory test
F0h	Initialize interrupt vectors
F1h	Initialize Run Time Clock
F2h	Initialize video
F3h	Initialize System Management Manager
F4h	Output One beep
F5h	Clear Huge Segment
F6h	Boot to Mini DOS
F7h	Boot to Full DOS

* If BIOS detects error code 2C, 2E, or 30 (base 512K RAM error), it displays an additional word-bitmap (xxxx) address line after the error code. For example, "2C 0002" means address line 1 (bit one set) has failed. "2E 1020" means data bits 12 and 5 (bits 12 and 5 set) have failed in lower 16 bits.

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For additional support, Siemens customers can contact their local Siemens Service Representatives. Siemens Customer Support Engineers can contact the following as required:

In North and South America:

Siemens Medical Systems, Inc.
EM-PCS
Technical Service and Support
16 Electronics Avenue
Danvers, MA 01923 USA
Tel: (978) 907-7500
FAX: (978) 907-7546

In Europe, Asia, Africa, Australia and New Zealand

Siemens-Eléma AB
EM
Technical Service and Support
171 95 Solna, Sweden

Tel: Int+46-8-730-7641
FAX: Int+46-8-986 662

